

JPRS-ULS-90-010  
2 JULY 1990

FOREIGN  
BROADCAST  
INFORMATION  
SERVICE

# ***JPRS Report***

19980128 142

# **Science & Technology**

---

***USSR: Life Sciences***

---

REPRODUCED BY  
U.S. DEPARTMENT OF COMMERCE  
NATIONAL TECHNICAL INFORMATION SERVICE  
SPRINGFIELD, VA. 22161

DTIC QUALITY INSPECTED 2

22161

SPRINGFIELD, VA  
5285 PORT ROYAL RD  
ATTN: PROCESS 103  
NTIS

39  
22161

DISTRIBUTION STATEMENT A

Approved for public release;  
Distribution Unlimited

# Science & Technology

## USSR: Life Sciences

JPRS-ULS-90-010

### CONTENTS

2 July 1990

#### AGRICULTURAL SCIENCE

Study of Toxicity of Tsibulins—Inducible Onion Antibiotic Substances [A. P. Dmitriyev, Yu. Yu. Malinovskiy, et al.; <i>MIKROBIOLOGIYA</i> , Vol 58 No 2, Mar-Apr 89]	1
Prospects of the Use of Path Coefficient Analysis in Crop Breeding [I. Yu. Gorbatenko; <i>IZVESTIYA AKADEMII NAUK SSSR: SERIYA BIOLOGICHESKAYA</i> , No 3, May-Jun 89]	1
Effect of Low Doses of Anthracycline Antibiotics on Crop Growth and Development [L. P. Trenozhnikova, L. A. Vetrugina, et al.; <i>IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR</i> , No 2, Mar-Apr 89]	1

#### BIOCHEMISTRY

Peptide Antibiotics Based on Human Preproenkephalin A Fragment [Ye. P. Kharchenko, A. Sh. Samedov, et al.; <i>DOKLADY AKADEMII NAUK SSSR</i> , Vol 307 No 1, Jul 89]	2
Synthesis and Anticholinesterase Activity of a Series of Alkaloid Derivatives and N-Heterocyclic Compounds [D. N. Dalimov, D. T. Karimov, et al.; <i>KHIMIYA PRIRODNYKH SOYEDINENIY</i> , No 6, Nov-Dec 88]	2
Primary Structure of Alanine Subunit of Ricin T Derived from Central Asian Castor Beans. Part 5. Peptides Produced by Cyanogen Bromide Cleavage [D. A. Khashimov, Kh. G. Alimov, et al.; <i>KHIMIYA PRIRODNYKH SOYEDINENIY</i> , No 6, Nov-Dec 88]	2
Immobilization of Cytochrome P-450 LM2 with Retention of Hydroxylation Activity [K. N. Myasoyedova, P. Berndt; <i>BIOLOGICHESKIYE NAUKI</i> , No 4, 89]	3
Synthesis of Physiologically Active Conjugate of Cationized BSA and Angiotensin II [A. P. Rostovtsev, O. O. Grigoryants, et al.; <i>DOKLADY AKADEMII NAUK SSSR</i> , Vol 306 No 6, Jun 89]	3
Effects of Root Rot Toxin on ATP Synthesis in Isolated Wheat Chloroplasts [T. Sh. Adeishvili, G. G. Simonyan; <i>IZVESTIYA AKADEMII NAUK GRUZINSKOY SSR: SERIYA BIOLOGICHESKAYA</i> , Vol 15 No 2, Mar-Apr 89]	3

#### BIOPHYSICS

Effects of Radioprotectors on Liver Microsomal Lipid Peroxidation Induced by UV Irradiation of Skin in Rats [Ye. N. Gorodovikova, T. I. Gudz, et al.; <i>BIOLOGICHESKIYE NAUKI</i> , No 4, 1989]	4
Effect of Dosed Treatment of Erythrocytes With Polyethylene Oxide With Molecular Weight 1500 on Alteration of Shape and Permeability of Their Plasma Membrane [A.M. Belous, L.A. Babiychuk, et al.; <i>DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B: GEOLOGICHESKIE, KHIMICHESKIE I BIOLOGICHESKIE NAUKI</i> , Jul 89]	4
Mechanism of Membranotropic Action of 1-Ethoxysilatrane [M. M. Rasulov, I. G. Kuznetsov, et al.; <i>DOKLADY AKADEMII NAUK SSSR</i> , Vol 306 No 6, Jun 89]	4
Bionic Model of Passive Electrolocation in Fish [Yu. B. Shaub, A. V. Khodzevich; <i>DOKLADY AKADEMII NAUK SSSR</i> , Vol 306 No 6, Jun 89]	5

#### BIOTECHNOLOGY

Production of Transgenic Progeny From Rabbits with acRNA Gene Against E1A Area of Adenovirus Ad h5 [L. K. Ernst, T. I. Tikhonenko, et al.; <i>DOKLADY VSESOYUZNOY ORDENA LENINA I ORDENA TRUDOVOGO KRASNOGO ZNAMENI AKADEMII SELSKOKHOZYAYSTVENNYKH NAUK IMENI V. I. LENINA</i> , No 6, Jun 89]	6
Regeneration of Plants From Individually Cultivated Tobacco Protoplasts [I. V. Kirichenko, P. V. Melnikov, et al.; <i>DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B: GEOLOGICHESKIE, KHIMICHESKIE I BIOLOGICHESKIE NAUKI</i> , No 7, Jul 89]	6

## EPIDEMIOLOGY

Diphtheria Outbreak in Soviet Union [V. Makarov; MEDITSINSKAYA GAZETA, 24 May 89]	7
Current Stage of Epidemiologic Surveillance, Prevention and Suppression of Malaria Transmission in Tadzhikistan [T. S. Kurbanov, A. U. Kuyma, et al.; ZDRAVOOKHRANENIYE TADZHIKISTANA, No 1, Jan-Feb 89]	8
Ecologic Basis of Potential Foci of Malaria in Kirghizia [A. A. Plishkin; ZDRAVOOKHRANENIYE KIRGIZII, No 2, Mar-Apr 89]	8
Study of Dynamics of Etiological Structure of Salmonellosis in AzSSR [Sh. G. Shakhabzov, Z. G. Gadzhiev, et al.; AZERBAYDZHANSKIY MEDITSINSKIY ZHURNAL, No 4, Apr 89]	8
Mammals of Southern Kirghizia as Possible Sources of Human Disease [S. N. Rybin, D. D. Risaliyev; BYULLENTEN MOSKOVSKOGO OBUHCHESTVA ISPYTATELEY PRIRODY: OTDEL BIOLOGICHESKIY, No 2, Mar-Apr 89]	8

## GENETICS

Integration and Amplification of Plasmid DNA in <i>Bacillus Subtilis</i> Chromosome [T. N. Shevchenko, Ye. O. Timashova, et al.; TSITOLOGIYA I GENETIKA, Vol 23 No 2, Mar-Apr 89]	10
--	----

## IMMUNOLOGY

Immunomodulating Properties of Interferon Inductors [F. I. Ershov, E. B. Tazulakhova; ANTIBIOTIKI I KHIMIOTERAPIYA, Apr]	11
Effect of Synthetic Betaine Analogs on Macrophage Functional Activity [V. K. Pozur, Ya. B. Blyum, et al.; DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLICHESKIYE NAUKI, No 7, Jul 89]	11
Effect of Tularemia Vaccine on Tumors Induced by DMBA in Rats [V. N. Zilfyan, V. A. Kumkumadzhyan, et al.; VOPROSY ONKOLOGII, Vol 35 No 4, 89]	11
Experimental Investigation of an Allergen Isolated From Protein Fraction of Listeria Antigen [P. R. Khashimova, L. A. Kondratyeva, et al.; ZDRAVOOKHRANENIYE TADZHIKISTANA, No 1, Jan-Feb 89]	11
Method of Determining Sensitization to Anthrax [V. V. Gylka, E. N. Shlyakhov; ZDRAVOOKHRANENIYE, No 1, Jan-Feb 89]	12

## INDUSTRIAL MEDICINE

Clinical Manifestations of Chronic Hyperthermia in Miners Working in Deep Coal Mines [I. F. Peftiyev, V. A. Maksimovich, et al.; VRACHEBNOYE DELO, No 5, May 89]	13
---	----

## LASER BIOEFFECTS

Intravascular Laser Blood Irradiation for Postoperative Complications in Laryngeal Cancer [I.Ya. Tsukerman, Z.D. Kitsmanyuk, et al; ZHURNAL USHNYKH, NOSOVYKH I GORLOVYKH BOLEZNEY, Jan-Feb 89]	14
Effects of Chronic Gastric Ulcer Irradiation with Helium-Neon Laser and Vagotomy on Gastric Microflora and Cytology [J.M. Baybekov, R.Sh. Mavlyan-Khodzhayev, et al; BYULLENTEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY, Jan 89]	14
Endoscopic Laser Treatment of Esophageal Chemical Burns: Clinical-Pathologic Study [M.A. Sapozhnikova, A.V. Kovanev; ARKHIV PATOLOGII, Jan 89]	14
Effects of Combination of Semiconductor IR Laser and Magnetic Field on Liver [N.P. Mikayelyan, I.M. Aliyev, et al; KHIRURGIYA, Jan 89]	14
Effects of Lasers on Drug Permeability of Ocular Tissues [G.A. Kiselev, O.I. Lebedev, et al; OFTALMOLOGICHESKIY ZHURNAL, No 8, 88]	15
Transscleral Coagulation of Retina and Ciliary Body with YAD-Nd Laser Odessa [T. Kenchik, L.A. Linnik, et al; OFTALMOLOGICHESKIY ZHURNAL]	15
Age-Related Changes in Energy Thresholds for Retinal Laser Coagulation [L.A. Linnik, G.I. Zheltov, et al; OFTALMOLOGICHESKIY, 88]	15
Treatment of Purulent Soft-Tissue Wounds With CO <sub>2</sub> Laser [A. P. Dotsenko, V. A. Khodos; KHIRURGIYA, No 6, Jun 89]	16

## MEDICINE

Endotoxemia and Criteria for Its Objective Assessment in Burn Patients [S. V. Smirnov, N. I. Gabrielyan, et al.; <i>KLINICHESKAYA MEDITSINA</i> , Vol 47 No 5, May 89]	17
Development and Study of Techniques for Electrophoresis and Phonoresis of Dicynone (Ethamsylate) [T. A. Imshenetskaya; <i>ZDRAVOOKHRANENIYE BELORUSSII</i> , No 4, Apr 89]	17
Fluorescent Laser Diagnosis of Metastasis of Cancer of Digestive Organs [V. I. Polsachev, Ye. V. Potemkina, et al.; <i>KHIRURGIYA</i> , No 5, May 89]	17
Efficacy of Aerosol Therapy Based on a Hypercapnic Gas Mixture [T. S. Lasitsa, N. A. Morozova; <i>VRACHEBNOYE DELO</i> , No 4, Apr 89]	17
Mechanisms of the Effect of SCN-D Hemosorbent on Functional Capacity of Donor Blood Stored for Long Periods [M. S. Povzhitkova, A. L. Belkin, et al.; <i>DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI</i> , No 7, Jul 89]	18
UV Irradiation of Autologous Blood in Combined Treatment of Septicemia [L. P. Butylin, N. N. Volobuyev, et al.; <i>AZERBAYDZHANSKIY MEDITSINSKIY ZHURNAL</i> , No 4, Apr 89]	18
X-ray Irradiation of Donor Blood in Combined Management of Purulent Conditions [A. S. Yermolov, R. B. Mumladze, et al.; <i>KHIRURGIYA</i> , No 6, Jun 89]	18
Blood Reinfusion Technique [V. P. Sukhorukov, T. P. Zakharishcheva; <i>KHIRURGIYA</i> , No 6, Jun 89]	19
Effect of Low- and Intermediate-Frequency Ultrasound on the Course of Purulent Wound Process [Yu. I. Pavlov; <i>KHIRURGIYA</i> , No 6, Jun 89]	19
Treatment of Purulent, Necrotic Limb Wounds [K. S. Ternovoy, Yu. S. Zhila, et al.; <i>KHIRURGIYA</i> , No 6, Jun 89]	19
Effect of Sorptive Wound Dressing on the Activity of Certain Enzymes and Inhibitors of the Kallikrein-Kinin System in the Context of the Dynamics of Traumatic Injury [Ye. V. Yeretskaya, S. I. Voyvanko, et al.; <i>KLINICHESKAYA KHIRURGIYA</i> , No 4, 89]	19
External Hardware Fixation of the Spine in Treatment of Spinal Disease and Injury [V. N. Lavrov, B. I. Byzov; <i>SOVETSKAYA MEDITSINKA</i> , No 4, 89]	20
Hemodialysis and Hemosorption in Combined Management of Acute Poisoning [O. V. Kurashov, V. A. Trotsevich, et al.; <i>VRACHEBNOYE DELO</i> , No 5, May 89]	20
Hormonal Contraceptives [Ya. G. Zhukovskiy; <i>ZDOROVYE</i> , No 6, Jun 89]	20
Significance of Correction of Microcirculatory Disorders at Inflammatory Sites in Sepsis Treatment [Ya. N. Shoykhet, Yu. M. Dederer, et al.; <i>KHIRURGIYA</i> , No 6, Jun 89]	20

## MICROBIOLOGY

Study of Capability of Bacterial Cells to Accumulate Colloidal Gold [S. V. Garbara, L. G. Stepura, et al.; <i>MIKROBIOLOGIYA</i> , Vol 58 No 2, Mar-Apr 89]	22
Rapid Determination of Microbial Antibiotic Sensitivity by Laser Spectroscopy [M. I. Lytkin, M. S. Polyak, et al.; <i>VESTNIK KHIRURGII IMENI I. I. GREKOVA</i> , Vol 142 No 5, May 89]	22
Fluorescence of <i>Bacillus thuringiensis</i> Induced by Anaerobic Conditions and Its Relationship to the Functional State of the Cell [Ye. I. Yefimtsev, Ye. V. Shtannikova; <i>BIOLOGICHESKIYE NAUKI</i> , No 5, May 89]	22
Efficiency of Permeation of Long-Chain Aliphatic Aldehydes Across Bacterial Membranes [V. A. Marganiya, Yu. A. Malkov, et al.; <i>BIOLOGICHESKIYE NAUKI</i> , No 4, 89]	22
Proteins of Phages of Methanotrophic Bacteria and Effect of Temperature and UV Light on Virions [F. M. Tyutikov, A. I. Turkin, et al.; <i>MIKROBIOLOGIYA</i> , Vol 58 No 2, Mar-Apr 89]	23
Mutants of Naphthalene Biodegradation Plasmids Encoding Meta Pathway for Catechol Oxidation [A. N. Kulakova, A. M. Boronin; <i>MIKROBIOLOGIYA</i> , Vol 58 No 2, Mar-Apr 89]	23
Endotoxicosis in Severe Mechanical Trauma and Sorption Methods of Its Treatment [S. D. Sheyanov, B. V. Shashkov, et al.; <i>VESTNIK KHIRURGII IMENI I. I. GREKOVA</i> , Vol 142 No 5, May 89]	23
Complications in Trauma Cases: Incidence, Features, and Etiopathogenesis [K. Ya. Gurevich, L. N. Gubar, et al.; <i>VESTNIK KHIRURGII IMENI I. I. GREKOVA</i> , Vol 142 No 5, May 89]	23
Treatment of Infected Wounds with Pulsating Lavage [I. G. Peregudov, P. N. Zubarev, et al.; <i>VESTNIK KHIRURGII IMENI I. I. GREKOVA</i> , Vol 142 No 5, May 89]	24

Luminescent Marine Bacteria as Research Subjects in Studies of Individual and Combined Actions of Heavy Metals <i>[I. A. Zholdakov, G. A. Dallakyan, et al.; VESTNIK MOSKOVSKOGO UNIVERSITETA, No 2, Apr-Jun 89]</i> .....	24
Content of Certain Nitrogenous Compounds in Biomass of Chlorella vulgaris Grown With Elevated Osmolarity <i>[V. A. Khramov, B. I. Bilmes, et al.; UZBEKSKIY BIOLOGICHESKIY ZHURNAL, No 2, Mar 89]</i> .....	24
Use of Licorice Cake for Production of Protein Feed Yeasts <i>[K. Akmamedov, Kh. Annadurdyev, et al.; IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK, No 2, Mar 89]</i> .....	25

## MILITARY MEDICINE

Organizational Aspects of Medical Care Given to Victims of Land Mine Explosions <i>[V. Khabibi, P. M. Nasanchuk, et al.; VOYENNO-MEDITSINSKIY ZHURNAL, No 4, Apr 89]</i> .....	26
---	----

## NONIONIZING RADIATION EFFECTS

Influence of Repeated Local Microwave Exposure on Immunohormonal Indices in Intact Animals <i>[I. D. Frenkel, S. B. Pershin, et al.; VOPROSY KURORTOLOGII FIZIOTERAPII I LECHEBNOY FIZICHESKOY KULTURY, No 2, Mar-Apr 89]</i> .....	27
--	----

## PHARMACOLOGY, TOXICOLOGY

Study of Biological Activity of Phenol Complex of Agrimonias Asiatica <i>[T. V. Ryakhovskaya, G. G. Ushbayeva, et al.; IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR, No 2, Mar-Apr 89]</i> .....	28
Effects of Hexapeptide Dalargin on Reparative Processes in Posttraumatic Bone Marrow Changes <i>[G. I. Lavrishcheva, N. T. Turgunov; MEDITSINSKIY ZHURNAL UZBEKİSTANA, No 3, Mar 89]</i> .....	28
Effects of Doxorubicin and Doxorubicin-Heparin Complex on Metastasis of Sarcoma-45 and on Hemostasis Following Surgical Removal of Primary Tumor <i>[T. M. Kalishevskaya, G. V. Bashkov, et al.; VESTNIK MOSKOVSKOGO UNIVERSITETA, No 2, Apr-Jun 89]</i> .....	28
Antineoplastic Activity of Certain Aziridine Derivatives <i>[A. V. Kazaryan, M. G. Avetyan, et al.; BIOLOGICHESKIY ZHURNAL ARMENII, Vol 42 No 2, Feb 89]</i> .....	28
Properties of Magnetically Controlled Liposomes Bearing Curariform Agents <i>[R. N. Alyautdin, V. I. Filippov, et al.; FARMATSIYA, Vol 38 No 3, May-Jun 89]</i> .....	29
Possibility of Enhancement of Therapeutic Efficacy of Antitumor Preparations <i>[N. P. Konovalova, L. M. Volkova, et al.; IZVESTIYA AKADEMII NAUK SSSR: SERIYA BIOLOGICHESKAYA, No 3, May-Jun 89]</i> .....	29
Study of the Role of the Aggregation Function of Thrombocytes in the Mechanism of the Antimetastatic Action of Scutellaria Baicalensis Extract <i>[T. G. Razina, S. N. Udintsev, et al.; VOPROSY ONKOLOGII, Vol 35 No 2, 89]</i> .....	29
Effects of Kupir on Musculocutaneous Wound Healing <i>[F. Kh. Seyfullin, Ye. Yu. Kinel, et al.; MEDITSINSKIY ZHURNAL UZBEKİSTANA, No 3, Mar 89]</i> ..	29
Case of Acute Poisoning by Methyl Chloroformate <i>[A. A. Penknovich, V. V. Anikin; GIGIYENA TRUDA I PROFESSIONALNNYE ZABOLEVANIYA, No 10, Oct 88]</i> .....	30
Novel Approach to Enhancing Drug Efficacy <i>[N. I. Kaletina, N. Yu. Stazhkova; FARMATSIYA, Vol 38 No 3, May-Jun 89]</i> .....	31

## PHYSIOLOGY

Effect of Cyclic Enkephalin Analog on Neural Protein Levels in Rat Hippocampus in Acquisition of Conditioned Reflex of Bilateral Avoidance <i>[O. L. Segal, V. N. Mats, et al.; BIOLOGICHESKIYE NAUKI, No 5, May 89]</i> .....	32
Neural Ensemble (Idea, Experiment, Theory) <i>[O. G. Chorayan; USPEKHI FIZIOLOGICHESKIKH NAUK, Vol 20 No 2, May-Jun 89]</i> .....	32

Cardiac Effects of Opioid Peptide Dermorphin in Cold-Blooded and Warm-Blooded Animals <i>[N. A. Sokolova, L. D. Kulagina, et al.; VESTNIK MOSKOVSKOGO UNIVERSITETA, No 2, Apr-Jun 89]</i> ....	32
Modification of Serum Alkaline Phosphatase and $\alpha$ -Amylase Activity in Modulation of State of Nervous System During Stress <i>[N. I. Guska; IZVESTIYA AKADEMII NAUK MOLDAVSKOY SSR: SERIYA BIOLOGICHESKIH I KHMICHESKIH NAUK, No 1, Jan 89]</i> .....	32
Use of Ultraviolet Radiation to Adjust the Immune System and Decrease Morbidity Among Athletes <i>[G. R. Gidineyshvili, R. S. Suzdalnitskiy, et al.; TEORIYA I PRAKTIKA FIZICHESKOY KULTURY, No 4, 89]</i> .....	33
Methodological Bases for Evaluating the Vestibuloocular Reflex <i>[I. A. Sklyut, S. A. Likhachev; VESTNIK OTORINOLARINGOLOGII, No 3, May-Jun 89]</i> .....	33

## PUBLIC HEALTH

Interferon Discounted as Possible Transmission Agent of AIDS <i>[V. I. Pokrovskiy Interview; ZDOROVYE, No 3, 89]</i> .....	34
Early Manifestation of Rectal Cancer <i>[R. A. Melnikov, D. P. Berezkin, et al.; VOPROSY ONKOLOGII, Vol 35 No 2, 89]</i> .....	34
Survival Rates for Stomach Cancer (Based on Data of the All-Union Center for the Study of Efficacy of Treatment of Malignant Tumors) <i>[D. P. Berezkin, V. N. Filatov, et al.; VOPROSY ONKOLOGII, Vol 35 No 2, 89]</i> .....	35
Incidence and Structure of Congenital Birth Defects in Neonates <i>[Z. A. Nuruyeva; ZDRAVOOKHRANENIYE KIRGIZII, No 2, Mar-Apr 89]</i> .....	35
The Problem of the Day—Brucellosis <i>[ZDRAVOOKHRANENIYE KAZAKHSTANA, No 3, Mar 89]</i> ....	35
Optimization of Oblast Hospital Management by Use of Hospital-Based Automatic Control System (ASU-STATSIONAR) <i>[Yu. V. Pyanov, N. F. Illicheva, et al.; SOVETSKOYE ZDRAVOOKHRANENIYE, No 4, 89]</i> .....	36
Problems and Prospects of the Planning for Hospital-Based Health Care in USSR <i>[V. P. Korzhagin, N. A. Kravchenko, et al.; SOVETSKOYE ZDRAVOOKHRANENIYE, No 4, 89]</i> .....	36
Medical and Sanitation Problems in the Aral Sea Region <i>[O. Petrova; ZDRAVOOKHRANENIYE KAZAKHSTANA, No 3, Mar 89]</i> .....	36
KASMON as a Data Base for Assessing Public Health <i>[O. P. Mintser, S. A. Platonov, et al.; SOVETSKOYE ZDRAVOOKHRANENIYE, No 2, 89]</i> .....	36
Tasks of the Health Care Agencies and Institutions in Terms of Carrying Out the 'Basic Guidelines for the Development of Public Health Protection and the Restructuring of Health Care in the 12th Five-Year Plan and in the Period up to the Year 2000' <i>[Ye. I. Chazov; SOVETSKOYE ZDRAVOOKHRANENIYE, No 2, 89]</i> .....	37
Problems in Assessing the Activity of Health Care From Qualitative Indices <i>[A. Ya. Nemenov; SOVETSKOYE ZDRAVOOKHRANENIYE, No 2, 89]</i> .....	47
Evaluation of Total Mutagenic Activity in Work Environment at Ferrous Metallurgy Plants <i>[K. S. Sedova; TSITOLOGIYA I GENETIKA, Vol 23 No 2, Mar-Apr 89]</i> .....	47
Women's Health: Primary Concern in Rural Health Care <i>[N. Ye. Chernova; ZDRAVOOKHRANENIYE KIRGIZII, No 2, Mar-Apr 89]</i> .....	47
Improving the Structure of Health Care Management <i>[B. I. Boyarintsev; SOVETSKAYA ZDRAVOOKHRANENIYE, No 6, Jun 89]</i> .....	48
Health Status of Pregnant Women and Children Under One Year of Age in the LiSSR <i>[R. K. Ignatyeva, O. S. Rachkauskene; SOVETSKAYA ZDRAVOOKHRANENIYE, No 6, Jun 89]</i> .....	51
Structure of Perinatal and Late Neonatal Mortality in Rural Areas <i>[R. I. Shmurun, V. B. Matskevich; ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII, No 1, 89]</i> .....	56
Joint Venture to Produce Disposable Syringes in Tashkent <i>[G. Kryuk, V. Zhuravlev; MEDITINSKAYA GAZETA, 7 Jun 89]</i> .....	59
Experience in the Use of the Economic Mechanism in the Activity of Medical Cosmetology Facilities <i>[V. A. Minayev, A. Ya. Uritskiy, et al.; SOVETSKOYE ZDRAVOOKHRANENIYE, No 4, 89]</i> .....	60
Logic-Semantic Modeling of Hardware and Software Configurations for Biomedical Measurements <i>[S. F. Ostap'yuk, Yu. V. Grum-Grzhimaylo, et al.; VESTNIK AKADEMII MEDITINSKIKH NAUK SSSR, No 4, 89]</i> .....	60
Materials From Press Releases of the BSSR State Commission of Statistics <i>[ZDRAVOOKHRANENIYE BEGORUSSII, No 2, Feb 89]</i> .....	60
Improving Annual Statistical Accounting <i>[F. G. Grigoryev; SOVETSKOYE ZDRAVOOKHRANENIYE, No 2, 89]</i> .....	61

## RADIATION BIOLOGY

Enhancement of Radioresistance of Genetic Structures of Plant Cells With Preliminary Low-Dose Gamma Irradiation of Seeds [N. V. Kulikov, L. K. Alshits; <i>EKOLOGIYA</i> , No 1, 89]	63
Radioprotective Effects of Magnesium Chloride on Redox Enzyme Activity and Chlorophyll Content in Cotton [A. Nigmanov, V. M. Pak, et al.; <i>UZBEKSKIY BIOLOGICHESKIY ZHURNAL</i> , No 2, Mar 89]	63

## VETERINARY MEDICINE

Prevention of Respiratory Diseases at Heifer Breeding Farms [V. V. Sinitskiy, V. S. Garin, et al.; <i>VETERINARIYA</i> , No 5, May 89]	64
Anthrax Prevention [N. G. Ipatenko, N. T. Tatarintsev, et al.; <i>VETERINARIYA</i> , No 5, May 89]	64
Effect of Immunostimulators on Antisalmonella Immunity in Calves [A. I. Tesh, V. M. Chekishev; <i>VETERINARIYA</i> , No 5, May 89]	64
Perestroyka and Cost Accounting in Veterinary Sciences [V. V. Filippov; <i>VETERINARIYA</i> , No 5, May 89]	64
Disinfection of Hen-Houses with Bactericidal Foams [D. I. Udal'iyev; <i>VETERINARIYA</i> , No 5, May 89]	65
Epizootiologic Monitoring of Listeriosis in Animals [I. A. Bakulov, V. M. Kotlyarov, et al.; <i>VETERINARIYA</i> , No 5, May 89]	65
Automated Epizootiologic Monitoring of Bovine Leukemia [G. A. Michule, V. A. Dzenis, et al.; <i>VETERINARIYA</i> , No 5, May 89]	65

## VIROLOGY

Specific Immunoglobulins From the Yolks of Eggs of Japanese Quail Immunized With Influenza and HIV-1 Viruses [A. A. Kovgan, Ye. I. Isayeva, et al.; <i>DOKLADY AKADEMII NAUK SSSR</i> , Vol 307 No 1, Jul 89]	66
---	----

UDC [582+579].04:577.18

**Study of Toxicity of Tsibulins—Inducible Onion Antibiotic Substances**

18400638A Moscow MIKROBIOLOGIYA in Russian  
Vol 58 No 2, Mar-Apr 89 (manuscript received  
2 Feb 88) pp 212-214

[Article by A. P. Dmitriyev, Yu. Yu. Malinovskiy and A. I. Dyachenko, Institute of Botany, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] In vitro inhibition studies were conducted on the spectrum of antimicrobial activity of tsibulins obtained by extraction of onion tissue with 96% ethanol following infection with *Botrytis cinerea*. Analysis of the zones of inhibition demonstrated that the Gram-positive bacteria (*Corynebacterium michiganense*, *Bacillus subtilis*, *C. fascians*) were somewhat more susceptible than the Gram-negative bacteria (*Xanthomonas campestris*, *Agrobacterium tumefaciens*, *Pseudomonas syringae*, *Erwiniā carotovora*). In addition, the tsibulins were also shown to be highly toxic to the fungi *Botrytis allii*, *Botrytis cinerea*, *Fusarium moniliforme*, and *Cladosporium* spp. Biochemical studies demonstrated that the tsibulins acted by inhibition of DNA and, especially, RNA synthesis. Figures 3; references 14: 9 Russian, 5 Western.

UDC 575:631.03

**Prospects of the Use of Path Coefficient Analysis in Crop Breeding**

18400640A Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA BIOLOGICHESKAYA in Russian No 3, May-Jun 89 (manuscript received 12 Aug 87)  
pp 371-377

[Article by I. Yu. Gorbatenko, All-Union Scientific Research Institute of Agricultural Biotechnology, Moscow]

[Abstract] A review is presented of the use of path coefficient analysis in crop breeding programs, especially

as this approach applies to the families Poaceae, Fabaceae, and Solanaceae. Comparison with correlation analysis has demonstrated that path coefficients provide more reliable information on relative contribution of individual traits to yield and quality parameters. On the basis of such data model varieties can be designed and bred for wide-scale use in agriculture. Path coefficient analysis is particularly useful when applied to crops cultivated on high-mineral soils and when various types of fertilizers are used, as well as in assessing temperature effects. In the latter case, reliance on path coefficient analysis facilitates selection of varieties optimal for given combinations of soil and climatic conditions. References 57: 15 Russian, 42 Western.

UDC 615.33.03:/619+636/

**Effect of Low Doses of Anthracycline Antibiotics on Crop Growth and Development**

18402139A Alma-Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR in Russian No 2, Mar-Apr 89  
pp 42-46

[Article by L. P. Trevozhnikova, L. A. Vetlugina and K. A. Tulemisova, Institute of Microbiology and Virology, KaSSR Academy of Sciences]

[Abstract] An analysis was conducted on the effects of low doses of anthracycline antibiotics on the growth of cucumbers and cabbage. The antibiotics were extracted from actinomycetes isolated from Kazakh soil samples. The seeds were treated with ethanol extracts of the antibiotics, with the effects on growth monitored under laboratory conditions. The results demonstrated that pretreatment of the seeds with 1 µg/ml solutions of the antibiotics promoted plant growth. The most pronounced stimulatory effects were seen with ε-pyrro (cinerubin, tauromycin, No 365) and rhodomycin (mycin, Nos. 457, 668, 697-2) antibiotics, and with the aglycone η-pyrromycinone. The work here represents the first time anthracycline antibiotics have been reported to promote plant growth. References 6 (Russian).

## BIOCHEMISTRY

UDC 577.112.6+577.18.48

**Peptide Antibiotics Based on Human Preproenkephalin A Fragment**

18400645 Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 307 No 1, Jul 89 (manuscript received 17 Nov 88) pp 249-252

[Article by Ye. P. Kharchenko, A. Sh. Samyedov, V. N. Kalikhevich, Z. A. Ardemasova and T. V. Sokolova, Institute of Evolutional Physiology and Biochemistry imeni I. M. Sechenov, USSR Academy of Sciences, Leningrad and Leningrad State University]

[Abstract] Although microorganisms are the principal producers of peptide antibiotics, vertebrates have also been shown to contain peptide antibiotics (see Zasloff's work with peptides from the skin of the *Xenopus* frog [PROC. NAT. ACAD. SCI USA, 1987, Vol 84, pp 5449-5453]). Unlike microorganism-derived peptides, which contain non-protein aminoacids and heterocomponents, those from the frog skin consist of common *l*-aminoacids. Earlier, the researchers reporting here proposed that, in addition to specialized regulatory peptides (RP), the human body also contains so-called scattered RP that should exceed in number the specialized RP, are part of proteins associated with the most varied of functions, and are released from the proteins as a result of proteolysis. The scattered RP may be responsible for local regulation in the body—nonspecific immune protection, for example; some may even exhibit direct antibiotic activity. The work reported here analyzed the antibiotic activity of 21 synthetic peptides representing short protein fragments with various functions, including opiate-like activity. The tests were performed on various bacteria species both in solid and in liquid media. On solid medium, the peptide KRFAE (containing amino acids lysine, arginine, phenylalanine, alanine, glutamic acid) from proenkephalin A showed the highest activity against gram-negative bacteria; in liquid medium, the peptide was inactive (as were the other peptides), evidently because of its sensitivity to proteases. *d*-Amino acids were then inserted in the KRFAE sequence to substitute for *l*-amino acids. A new peptide antibiotic *d*KRF-*d*LE was obtained, with stable activity against a broad spectrum of bacteria. These peptides may exist in quasi-cyclic structures in solution, and their activity could be due to their interference with ionic conductivity of the bacterial membrane. These data suggest that peptides may act as nonspecific protectors of the body against infections. Figure 1; references 8: 6 Russian, 2 Western.

UDC 547.94:547.1.118

**Synthesis and Anticholinesterase Activity of a Series of Alkaloid Derivatives and N-Heterocyclic Compounds**

18400634A Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 6, Nov-Dec 88 (manuscript received 9 Dec 87) pp 825-831

[Article by D. N. Dalimov, D. T. Karimov, G. M. Vayzburg, A. A. Abduvakhabov, L. K. Abdullayeva and

F. G. Kamayev, Institute of Bioorganic Chemistry imeni A. S. Sadykov, Uzbek SSR Academy of Sciences, Tashkent]

[Abstract] Cursory details are provided on the synthesis of N-methyl- and N-phenylcarbamates incorporating morpholine, piperidine, lupinine, epi-lupinine, anabasine, cytisine or 8-hydroxyquinoline as part of a screening study for highly specific cholinesterase inhibitors. The compounds were tested on human erythrocyte acetylcholinesterase (AChE) and equine serum butyrylcholinesterase (BChE). Analysis of reaction kinetics demonstrated that all of the compounds behave as irreversible, but weak, inhibitors of AChE and BChE. The tabulated data demonstrated that of the N-methylcarbamates the 8-hydroxyquinoline derivative is the strongest inhibitor of AChE and the lupinine derivative the strongest inhibitor of BChE. The N-phenylcarbamates were far more inhibitory for BChE than for AChE, with the greatest inhibitory activity exhibited by N-phenyl-o-lupininecarbamate. To assess the importance of steric factors of the choline-like fragment a series of corresponding iodomethylates of the N-β-hydroxymethyl- and N-β-hydroxypropyl- derivatives, including salsolidine, were tested and demonstrated to be reversible competitive and mixed-type inhibitors for both enzymes. Introduction of the methyl group into the ethylene bridge raised the  $K_i$  in all cases. N-β-hydroxypropylsalsolidine exhibited the greatest specificity for BChE and N-β-hydroxypropylpiperidine for AChE. These observations suggest that improved carbamate inhibitors may be obtained by rendering the methylcarbamic residue more hydrophobic and replacement of the choline fragment by β-methylcholine analogs. References 15: 11 Russian, 4 Western.

UDC 665.117.4.093.5

**Primary Structure of Alanine Subunit of Ricin T Derived from Central Asian Castor Beans. Part 5. Peptides Produced by Cyanogen Bromide Cleavage**

18400634B Tashkent KHIMIYA PRIRODNYKH SOYEDINENIY in Russian No 6, Nov-Dec 88 (manuscript received 2 Feb 88) pp 845-848

[Article by D. A. Khashimov, Kh. G. Alimov and P. Kh. Yuldashev, Institute of Chemistry of Plant Substances, Uzbek SSR Academy of Sciences, Tashkent]

[Abstract] Cyanogen bromide cleavage of the alanine subunit (256 amino acids) of ricin T led to the isolation of four peptides on Sephadex G-50 columns, arbitrarily designated B-1, B-2, B-3, and B-4. Determinations of the C- and N-terminal amino acids demonstrated that B-4 represents the N-terminal portion of the Ala-subunit, and B-3 the C-terminal portion. The disposition of the four peptide fragments in the Ala-subunit was determined to be the following: B-4:B-1:B-2:B-3. References 3: 2 Russian, 1 Western.

UDC 577.158

**Immobilization of Cytochrome P-450 LM2 with Retention of Hydroxylation Activity**

18402126B Moscow BIOLOGICHESKIYE NAUKI in Russian No 4, 89 (manuscript received 14 Dec 87) pp 18-25

[Article by K. N. Myasoyedova and P. Berndt, Institute of Chemical Physics, USSR Academy of Sciences]

[Abstract] Cytochrome P-450 LM2 derived from the endoplasmic reticulum of rabbit liver cells after phenobarbital induction was subjected to immobilization on Sepharose 4B in a manner designed to preserve the hexameric structure of the native enzyme. Catalytic and spectroscopic studies demonstrated that the immobilized enzyme retained the quaternary structure of a hexamer and was linked to cyanogen bromide-activated Sepharose 4B via one of the monomeric units. The successful step involved the use of low concentrations of cyanogen bromide (2-20 mg/g Sepharose 4B) to ensure a low degree of activation of Sepharose 4B and minimize enzyme inactivation. Figures 6; references 22: 9 Russian, 13 Western.

UDC 577.1

**Synthesis of Physiologically Active Conjugate of Cationized BSA and Angiotensin II**

18400626 Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 306 No 6, Jun 89 (manuscript received 14 Nov 88) pp 1500-1502

[Article by A. P. Rostovtsev, O. O. Grigoryants, V. V. Fomin and O. A. Gomazkov, Scientific Research Institute of Medical Enzymology, USSR Academy of Medical Sciences, Moscow]

[Abstract] The principal limiting factor in utilization of regulatory peptides as pharmacological agents is their poor penetration of the blood-brain barrier (BBB). One possible technique for enabling peptides penetrate the barrier involves the use of a protein-peptide conjugate which consists of a protein carrier capable of BBB penetration and a regulatory peptide. The goal of this study was to synthesize a conjugate of cationized BSA and angiotensin II and to test it on a model of muricidal

behavior in rats. Conjugate production consisted of two stages: synthesis of cationized BSA and conjugation with angiotensin II. The cationization was performed with a method that was advanced by Pardridge *et al.* (BIO-CHEM. BIOPHYS. RES. COMMUN., 1987, Vol 146, pp 307-313), but was modified by the authors, who used octamethylene diamine and N-cyclohexyl-N'-(2-morpholinoethyl)carbodiimide-meta-n-toluolene sulfonate. Since more than 90% of the protein had forms with  $pI > 9.0$ , no further purification of the BSA preparation was necessary. Benzoquinone was used in the subsequent conjugation, which bound approximately seven moles of angiotensin II to one mole of cationized BSA. The conjugate was then injected into the caudal vein of rats in quantities equivalent to 5, 0.5, and 0.05  $\mu\text{m}$  of free peptide. Inhibition of muricidal behavior diminished with the smaller doses (dropping from 28 days to 5 hours). The prolonged physiologic activity at doses considerably below those of the free peptide may be due to the effective transport through the BBB or to better protection of the angiotensin from the hydrolyzing action of endogenous peptidases. Figures 1; references 5: 1 Russian, 4 Western.

UDC 577.3

**Effects of Root Rot Toxin on ATP Synthesis in Isolated Wheat Chloroplasts**

18402177 Tbilisi IZVESTIYA AKADEMII NAUK GRUZINSKOY SSR: SERIYA BIOLOGICHESLAYA in Russian Vol 15 No 2, Mar-Apr 89 (manuscript received 28 Dec 87) pp 131-134

[Article by T. Sh. Adeishvili and G. G. Simonyan, Regional Branch, All-Union Scientific Research Institute of Agricultural Biotechnology, Tbilisi]

[Abstract] An ether fraction of the fungus Bipolaris sorokiniana enriched in helminthosporal was tested for its effects on ATP synthesis in chloroplasts isolated from Omsk-9 wheat shoots. The toxic fraction of *B. sorokiniana* was shown to inhibit ATP synthesis in a dose-dependent manner by uncoupling oxidative phosphorylation, without affecting the photoinduced pH gradient. The exact mechanism of uncoupling remains to be elucidated, but may involve interference with a coupling factor and/or alterations in thylakoid membrane permeability. Figures 2; references 8: 5 Russian, 3 Western.

UDC 577.352.38

**Effects of Radioprotectors on Liver Microsomal Lipid Peroxidation Induced by UV Irradiation of Skin in Rats**

*18402126A Moscow BIOLOGICHESKIYE NAUKI in Russian No 4, 89 (manuscript received 2 Nov 87) pp 15-18*

[Article by Ye. N. Gorodovikova, T. I. Gudz, Ye. N. Goncharenko and Yu. B. Kudryashov, Chair of Biophysics, Moscow State University]

[Abstract] A study was designed to determine whether agents that diminish x-ray-induced elevation of liver microsomal lipid peroxidation (LP) would also affect activation of LP seen with UV irradiation of the skin. Accordingly, outbred albino rats (140-180 g) were pretreated intraperitoneally with 35 mg/kg serotonin, 180 mg/kg cysteamine, or 400 mg/kg ionol 30 min before a 20 cm<sup>2</sup> depilated skin area was UV irradiated with a 215 kJ/m<sup>2</sup> dose. Assessment of NADPH-dependent LP showed elevation of hepatic LP in response to skin irradiation with the UV light, and virtually complete reversal of the UV effect in animals pretreated with the radioprotective agents. Since the three agents also attenuated UV-induced changes in the skin (i.e., activation of LP and reduction of antiradical activity), the data indicate that products formed in the course of LP in the skin also affect liver microsomal LP. Figures 3; references 8: 4 Russian, 4 Western.

UDC 57.043:612.111

**Effect of Dosed Treatment of Erythrocytes With Polyethylene Oxide With Molecular Weight 1500 on Alteration of Shape and Permeability of Their Plasma Membrane**

*18400627 Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B: GEOLOGICHESKIE, KHIMICHESKIE I BIOLOGICHESKIE NAUKI in Russian No 7, Jul 89 (manuscript received 27 Jan 89) pp 59-63*

[Article by UkrSSR Academy of Sciences Corresponding Member A. M. Belous, L. A. Babiychuk and N. G. Zemlyanskikh, Institute of Cryobiological and Cryomedicine Problems, UkrSSR Academy of Sciences, Kharkov]

[Abstract] Earlier studies showed that cold treatment of human erythrocytes with hypertonic solution of NaCl or the cryoprotector polyethylene oxide (MW 1,500) alters their resistance to profound freezing (down to -196°C). The changes in cell properties were due to changes in cell shape and volume, alteration of the lipid bilayer and the membrane skeleton proteins, and redistribution of intracellular ions. Little research, however, has been done on the mechanisms underlying the changes in shape and volume or the redistribution of the intracellular ions. The aim of the work reported here was to continue research on the effect of cold dosed treatment of erythrocytes on shape

changes and redistribution of intracellular K<sup>+</sup> after they have been frozen at a temperature of -196°C under the protection of PEO-1500 polyethylene oxide. The cells, taken from donor blood, were frozen by immersion in liquid nitrogen and thawed in a water bath at 42°C. Gradual addition of cryoprotector at low temperature led to cell dehydration, but the shape of the cell membrane was not affected. A single addition of the cryoprotector at room temperature led to marked dehydration and deformation of the cells. Dosed addition of PEO-1500 at room temperature, followed by freezing, did not protect the erythrocytes. Dosed addition of the cryoprotector at 0°C does not have any negative effect on shape or condition of cell membrane, i.e., after thawing, the cells have shapes very near those of native erythrocytes. Cells treated with PEO-1500 at room temperature are severely deformed, and spherocytes appear. Alteration of shape was found to be a function of change in molecular structure of skeletal proteins. Shape changes may be accompanied by a redistribution of proteins and lipids to various parts of the membrane. After cold treatment with PEO-1500, visible changes in membrane permeability to K<sup>+</sup> were absent. After freezing and thawing of samples treated at room temperature, K<sup>+</sup> permeability increases; whereas the effect is considerably less pronounced with cold treatment. Overall, the dosed treatment of erythrocytes with PEO-1500 at low positive temperatures stabilizes cell shape and permeability to ions and biomolecules, serving as an important mechanism in elevating cell resistance to deep freezing. Figures 2; references 7: 2 Russian, 5 Western.

UDC 577.3:547.245

**Mechanism of Membranotropic Action of 1-Ethoxysilatrane**

*18400625A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 306 No 6, Jun 89 (manuscript received 26 Oct 88) pp 1479-1482*

[Article by M. M. Rasulov, I. G. Kuznetsov and A. A. Belousov, Irkutsk Institute of Organic Chemistry, Siberian Department, USSR Academy of Sciences; All-Union Scientific Research and Design Institute of the Meat Industry, Moscow]

[Abstract] In order to define the mechanisms responsible for membrane-active properties of silatrane, a study was conducted on the effects of 1-ethoxysilatrane (ES) on a series of membrane systems represented by bilayer lipid membranes, liposomes, submitochondrial particles derived from rat myocardium, and erythrocytes. Assessment of the effects of ES on enzymatic activities and physicochemical properties of target membranes demonstrated that ES was adsorbed to the membranes in a stereospecific manner because of its high dipole moment, resulting in electrostatic interaction with polar groups of membrane proteins and lipids. The latter interaction stabilizes both the ES molecules and the membranes. Concomitantly, affinity of hemoglobin for oxygen increases and shifting of the polar groups may lead to membrane liquefaction. Displacement of the heads of the lipids and

additional electrostatic interactions of ES with the membrane would appear to bar access of peroxide radicals to the alkyl chains of the lipids, thereby preventing or limiting lipid peroxidation. On balance, the data indicate that ES is capable of inducing a new quasiequilibrium state in cytoplasmic membranes, with the resultant conformational transitions modifying membrane function. Figures 4; references 12: 8 Russian, 4 Western.

UDC 577.3.591.512

**Bionic Model of Passive Electrolocation in Fish**

*18400625B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 306 No 6, Jun 89 (manuscript received 19 Oct 88) pp 1482-1485*

[Article by Yu. B. Shaub and A. V. Khodzevich, Pacific Oceanologic Institute, Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok]

[Abstract] Mathematical analysis is presented of a putative bionic model for passive electrolocation in fish, i.e., the demonstrated ability to detect exogenous weak electrical fields and determine their points of origin. The approach was based on the measurement of passive divergence. For purposes of first approximation the point of origin is considered to be dipolar in nature with a moment of orientation of  $P = P_x l_x + P_y l_y + P_z l_z$  and continuously varying coordinates determined by the vector  $R = xl_x + yl_y + zl_z$ . Computer simulation and data manipulation demonstrated that this approach, relying on six parameters of the emitter, provided accurate localization of the latter, depending on the strength of  $P$ . An actual biological system based on hundreds or thousands of individual receptors can, therefore, be assumed to offer extremely accurate localization of electric field emitters. Figures 1; references 4 (Russian).

UDC 636.92:57.083.2

**Production of Transgenic Progeny From Rabbits with acRNA Gene Against E1A Area of Adenovirus Ad h5**

18402157 Moscow DOKLADY VSESOYUZNOY ORDENA LENINA I ORDENA TRUDOVOGO KRASNOGO ZNAMENI AKADEMII SELSKOKHOZYAYSTVENNYKH NAUK IMENI V. I. LENINA in Russian No 6, Jun 89 (Manuscript received 22 Nov 88) pp 40-42

[Article by Academy of Agricultural Sciences imeni V. I. Lenin Academician L. K. Ernst, Academy of Agricultural Sciences imeni V. I. Lenin Corresponding Member T. I. Tikhonenko, N. M. Surayeva, O. I. Mironchenko, All-Union Scientific Research Institute of Agricultural Biotechnology]

[Abstract] Creation of agricultural animals with superior resistance to viral diseases can be achieved by the use of countersense RNA, i.e., RNA complementary to information RNA. The purpose of this work is the production of transgenic rabbits with the acRNA gene against the adenovirus Ad h5 and the study of the nature of heredity of this gene in the progeny. The search for methods to control adenovirus diseases has great economic significance. Five animals of 14 were found to be transgenic following injection of a plasmid converted to linear form with Bam H1 restrictionase and cultivation of the zygotes for one day at 38°C. The developing 4- to 8-cell embryos were transplanted to synchronized recipient females 20-22 hours after administration of chorionic hormone. Plasmid DNA was injected into 154 rabbit zygotes, yielding 135 embryos which were transplanted to nine recipients, three of which yielded progeny, a total of 14 rabbits, five of which were transgenic. References 9: 2 Russian, 7 Western.

UDC 578.085

**Regeneration of Plants From Individually Cultivated Tobacco Protoplasts**

18400628 Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 7, Jul 89 (manuscript received 20 Feb 89) pp 63-65

[Article by I. V. Kirichenko, P. V. Melnikov and Yu. Yu. Gleba, Division of Cellular Biology and Engineering, Botanical Institute, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] Most cell culture methods have been developed for mass production. Occasionally, however, it is necessary to cultivate only a few cells or even individual cells or plant protoplasts in a microvolume of nutrient. The researchers here describe a simple, inexpensive, effective method for cultivation of individual cells and protoplasts that involves subsequent regeneration of plants from them. Two drops of T<sub>0</sub> medium (one drop 100 µl, the other 50 µl) were placed in 40-mm Petri dishes and covered with purified oil. To the dishes with the large drops, 10 µl of a protoplast suspension (density, 10,000/ml) were added. Fifth-fraction BSA was added to some media (concentration 4 mg/ml). The protoplasts were grown in the medium, with or without the BSA. The results were identical in the production of tobacco plants, except that addition of protein to the medium markedly increases the efficiency of the transfer process, promoting survival of almost all protoplasts and bringing the transfer rate to 100-200/hour. BSA was effective at concentrations of 0.01 mg/ml or higher, but lost its effectiveness at 10 mg/ml, at which point it destroyed the protoplasts. The stabilizing effect of the addition of the protein was apparently due to lower surface tension in the medium and higher viscosity. Planting efficiency was 80%. The medium needed to be changed only three times during the cell growth period. Live plants were obtained in 2-3 months. This method can be used for cloning selected protoplasts of somatic hybrids, genetic transformation of plants by nonselective plasmids, production and analysis of somaclonal variants, etc. Figures 4; references 10: 1 Russian, 9 Western.

**Diphtheria Outbreak in Soviet Union**

18402095 Moscow MEDITINSKAYA GAZETA in Russian 24 May 89 p 4

[Article by MEDITINSKAYA GAZETA correspondent V. Makarov, from Khabarovsk, under the rubric "Asking It Point-Blank": "Is It Too Soon to Forget About Diphtheria?"; first paragraph is source introduction]

[Text] The outbreak of the infection at Birobidzhan has raised quite a bit of commotion in that part of the country. The report caused bewilderment among many of those living along the Amur River. In time, they were even talking about the infection in Khabarovsk itself. And here, too, they scratched their heads. After all, diphtheria had scarcely been mentioned here for many long years. The plans to vaccinate the population were being carried out in full. In the three previous years, at Birobidzhan, for example, there were only three recorded cases of diphtheria and seven of toxicogenic carriers. But in November and December of 1988, 48 persons came down with the sickness. Forty three carriers were found.

Why did the situation take such a difficult turn at the oblast center? There were several reasons. And none of them was accidental. This is confirmed by the new outbreak of diphtheria in the Khabarovsk Kray. The first reason—and a quite important one—was the lack of vigilance on the part of the medical personnel with regard to the infection, which had been forgotten about as the years passed. Here's how the situation at Birobidzhan took shape, for example. On 3 Nov 1988, a driver from a mobile mechanized column came to the polyclinic. The physician diagnosed ulcerative-necrotic angina and gave orders to have him admitted to the infectious hospital. With this, he felt he had performed his duty. The patient showed up at the hospital six days later, after having come to the conclusion that there was no way to avoid treatment. Nor was the situation any better at the hospital: it took twelve days for the initial diagnosis for this patient to be changed to diphtheria.

The lack of vigilance among the doctors is also witnessed in a case at the Birobidzhan Boarding School No. 1. Here, 26 children and 1 adult became ill. And tardiness in taking the right steps led to the occurrence of 17 foci of disease in the oblast center. Most of the medical personnel of the kray, incidentally, do not have the proper vaccinations. For example, only 30 of the 120 physicians at the polyclinic of the Birobidzhan oblast hospital had been vaccinated. Cases of infectious illness among medical personnel were noted at Komsomolsk-na-Amure and in a number of rayons, including the Amurskiy, Vaninskiy, and Vyazemskiy rayons.

The problem of diphtheria diagnosis is causing serious concern. In many cases, its clinical picture was initially evaluated as otorhinolaryngological disease, laryngotracheitis, bronchitis, pneumonia, or diabetic colic.

"And with all that," notes chief epidemiologist of the department of health of the kray, candidate of medical sciences A. Zherdeva, "there are still shortcomings in the immunoprevention program. The polyclinics, especially those of the rural rayons, are not promptly vaccinating and revaccinating, which also has an impact on the formation of immunity and its strength."

We should also add that the vaccination plans of the polyclinics are deliberately being cut back, and they are written without any consideration of the numbers of inhabitants. Thus, for example, at the Birobidzhan oblast polyclinic, a check revealed no data on the extent of the immunization, and, accordingly, the vaccination plans were being assembled on the basis of rough estimates. It was for the auditors—not for practicality. At Khabarovsk, for example, the vaccination plan for the adult population in 1988 was only 21 percent fulfilled, while not more than 18 percent of the adult population are vaccinated. The situation is not much better at Nikolayevsk-na-Amure, with 26 percent of its plan fulfilled, or in the Solnechnyy Rayon, with 33.6 percent. In the Amur Rayon, where a continual tension is observed in the epidemiological status of diphtheria, the vaccination plan is 44.4 percent fulfilled.

There is much talk today of clarity of information. Yet the health-and-epidemiology station learned of the occurrence of the diphtheria cases in Birobidzhan only on 15 November—ten days later—and the department of health learned of them on the 24th. How could this be? Negligence, or inability to act in a difficult situation? Or an effort to wait out the unpleasant facts and not report them—perhaps it would all pass? It turns out that the medical people of the oblast are not in contact with the medical service of the Far East military district, nor do the oblast and kray health-and-epidemiology stations have the necessary information as to the epidemiological situation of diphtheria among the military. Even in cases in which military servicemen are the source of the infection, the necessary information arrives tardily.

Nor is the treatment of those who've come down sick any better. The hospitals are not fully supplied with all requisites for the vaccination, there is an acute shortage of ordinary syringes, and there aren't any disposable syringes. The Khabarovsk Kray receives erythrocyte diphtheria test kits of such poor quality that they are practically unusable. This year, there was no delivery of test kits at all.

The difficulty of examining angina patients for diphtheria is greatly complicated by the landscape of the region. Dozens of tiny villages are located at considerable distance from the treatment centers with the bacteriological laboratories. On-the-spot analysis, even with a specialist present, is prevented by total lack of portable thermal devices and portable containers for culture media. Furthermore, it is claimed that even the hospital bacteriological laboratory does not have enough of the necessary implements and Petri dishes. As we see, these

## EPIDEMIOLOGY

JPRS-ULS-90-010  
2 July 1990

are only partial shortages, but the result is clear—the forgotten disease has gone on a rampage.

### **Current Stage of Epidemiologic Surveillance, Prevention and Suppression of Malaria Transmission in Tadzhikistan**

*18402134b Dushanbe ZDRAVOOKHRANENIYE TADZHIKISTANA in Russian No 1, Jan-Feb 89 (manuscript received 6 May 88) pp 76-77*

[Article by T. S. Kurbanov, A. U. Kuyma, B. Sh. Shoismatulloyev and S. A. Alidokhonov, Republican Sanitation-Epidemiologic Station, Tadzhik Scientific Research Institute of Epidemiology and Hygiene]

[Abstract] In 1975 the Tadzhik Ministry of Health published "Methodological Instructions for the Organization of Preventive Measures Against Malaria in Tadzhik SSR," with special stress on the risk of recurrent transmission of previously eradicated malaria throughout the republic. The area along the Amu-Darya and Pyandzh rivers stretching from Shaartuzskiy Rayon in the west to Vanchskiy Rayon in the east was designated as a high-risk area with respect to new malaria foci. In the past 13 years, because of irrigation projects, the profile of malaria spread has changed considerably, as have the carriers of this disease: *An. superpictus* has been replaced by *An. hyrcanus* and *An. pulcherrimus*, which attack their targets outside the normal habitat, making control by persistent insecticides much more difficult. Where the original *An. superpictus* are still in existence, they have developed resistance to DDT. Three stages are recognized in the epidemiologic process of malaria: (1) sporadic morbidity, (2) local outbreaks and (3) epidemiological intensification of the disease. The control measures proposed include routine epidemiological surveillance, intensified epidemiological surveillance, preventive measures against transmission, local measures suppressing transmission, continuous group and regional measures to suppress transmission. New control methods introduced in recent years include aerial spraying with metathione, sumithione, and carbophos; treatment with thermomechanical aerosols; administration of antimalarial preparations tindurine [tindurin] and delagyl [delagil].

### **Ecologic Basis of Potential Foci of Malaria in Kirghizia**

*18402136B Frunze ZDRAVOOKHRANENIYE KIRGIZII in Russian No 2, Mar-Apr 89 pp 8-11*

[Article by A. A. Plishkin, Chair of Biology, Kirghiz State Medical Institute]

[Abstract] Recent review of the sanitary practices and activities of the parasitological services in Kirghizia have shown inadequate attention to the potential threat of malaria, particularly with the known influx of residents from endemic areas. The threat comes from

the fact that Kirghizia has two broad bands of territory with mosquitoes that may serve as vectors for plasmodia. One band (800-1500 m above sea level) is represented by the Chuysk, Talas, Ketmentebinsk, and Fergana region valleys. Six species of mosquitoes have been identified there (*Anopheles messeae*, *A. martinii*, *A. claviger*, *A. hyrcanus*, *A. superpictus*, *A. pulcherrimus*) with an index of dominance approaching 35%. The second band (1500-2000 m) consists of Sredne-Naryn, Issyk-Kul, Dzhamgal, Atbashinsk and other valleys and is populated with three species (*A. messeae*, *A. claviger*, *A. hyrcanus*) with an index of dominance ranging from 7 to 29%. The fundamental factors that point to a potential outbreak of malaria come from the relatively low index of suspicion on the part of the clinical personnel and inadequate monitoring and control measures on the part of public health authorities. Figures 2.

UDC 616.98:579.842.14

### **Study of Dynamics of Etiological Structure of Salmonellosis in AzSSR**

*18402138A Baku AZERBAYDZHANSKIY MEDITSINSKIY ZHURNAL in Russian No 4, Apr 89 pp 62-63*

[Article by Sh. G. Shakhabazov, Z. G. Gadzhiev, K. S. Efendiyyev and Ye. D. Baksanskaya, Scientific Research Institute of Epidemiology, Hygiene and Occupational Diseases, AzSSR Ministry of Health]

[Abstract] A serologic analysis was conducted on the salmonella isolated from clinical cases in Azerbaijan from 1981 to 1987, for comparison with the etiologic profile of isolates obtained in the 1968-1973 time-frame. The data revealed that 95.58% of the isolates in 1981-1987 consisted of *Salmonella typhimurium*, as opposed to 3.15% in 1968-1973. In the various rural regions the number of serovars varied from 5 to 11. The change with time in the etiologic agents further defines the need for alertness on the part of the epidemiologic services in providing accurate status indicators for communicable diseases in Azerbaijan. References 9 (Russian).

UDC 599.524.22(575.25):613.0

### **Mammals of Southern Kirghizia as Possible Sources of Human Disease**

*18402142 Moscow BYULLETEN MOSKOVSKOGO OBSHCHESTVA ISPYTATELEY PRIRODY: OTDEL BIOLOGICHESKIY in Russian No 2, Mar-Apr 89 (manuscript received 18 Feb 88) pp 17-22*

[Article by S. N. Rybin and D. D. Risaliyev]

[Abstract] A brief analysis was conducted on some of the 70 species of wild mammals in Southern Kirghizia (essentially within the boundaries of the Osh Oblast), falling into 6 suborders, and their potential role in

human infections. The data includes cursory information on locations and preferred habitats, as well as data on recovered ectoparasites and isolated microbial pathogens of medical significance. This information is

intended to supplement that available in the 1972 monograph by Yanushevich et al. [“Mlekopitayushchiye Kirgizii” (Mammals of Kirghizia), Frunze, 1972]. References 16 (Russian).

## GENETICS

UDC 575.1:579.852.11

**Integration and Amplification of Plasmid DNA in  
Bacillus Subtilis Chromosome**

18402120b Kiev TSITOLOGIYA I GENETIKA in  
Russian Vol 23 No 2, Mar-Apr 89 (manuscript received  
28 Oct 87) pp 53-58

[Article by T. N. Shevchenko, Ye. O. Timashova, V. V. Fomin and G. D. Telegeyev, Institute of Molecular Biology and Genetics, UkrSSR Academy of Sciences, Kiev]

[Abstract] The engineering of chimeric chromosomes containing foreign genes is a rapidly developing area of gene engineering. It has been shown that prokaryotes—*B. subtilis* and foreign prokaryotic and eukaryotic genes—can be inserted in a chromosome and that, during recombination, the integrating fragment can turn out to be flanked by repeating sequences, which makes it possible to amplify foreign DNA in a chromosome. It has also been shown that plasmid DNA that are not homologous with the *B. subtilis* chromosome can be integrated

into a chromosome. As a rule, such plasmids contain the temperature-sensitive replicon pE194, which makes it possible to weed out integrators that seldom appear. The work here reports data on the potential of inserting plasmids pHV14 and pP1251 into the chromosome of *B. subtilis* strains that occur with high frequency during the transformation process. The possibility is also shown of amplifying the integrated structures in chromosomal DNA. Integration of plasmid genes in the chromosome occurred at several sites. During selection of clones on media with increasing concentration of chloramphenicol in chromosomal DNA (20-300 µg/ml), significant amplification (50 to 100 copies) of plasmid genes took place. The plasmid pHV14 consists of the plasmids pBR322 (which assures replication of *E. coli*) and pC194 (capable of reproducing in *B. subtilis*). The plasmid pP1251 contains two copies of pBR322 linked to pC194 and pSM22095 isolated from *Streptococcus pyogenes* by the plasmid. Integrated plasmid DNA found in the chromosome were represented as clusters, single copies and their fragments. Figures 1; references 16: 10 Russian, 6 Western.

UDC 615.339:578.245].015.46.07

### Immunomodulating Properties of Interferon Inductors

18400594B Moscow ANTIBIOTIKI I  
KHIMIOTERAPIYA in Russian Vol 34 No 4, Apr 89  
(manuscript received 8 Jan 88) pp 270-276

[Article by F. I. Ershov, E. B. Tazulakhova, Scientific Research Design and Production Institute of Biologically Active Substances, USSR Ministry of Medical and Microbiological Industry, Berdsk]

[Abstract] Data obtained in recent years on the direct and reversible links between the immune system and interferon are summarized. Interferon inductors may be used as an antiviral remedy as well as for regulating immunity. Viruses used included influenza A/Pr 8/34 (HONI), common herpes (strain L2 type I), rabies (strain Yak), acute human encephalomyelitis (Reznik strain), and mouse encephalomyocarditis (Columbia strain). Vaccines were prepared, and inbred mice were used for studying humoral response. CBA mice were used for inducing interferon and isolating cells of the immune system. Polyguacil, lafarin, poly(I)poly(Ts), inosiplex, and dextran sulfate were used as interferon inductors and immunomodulators. The researchers found that the combined use of immunomodulators and ds-RNA leads to stimulation of the interferon and immune systems—i.e., to an increase in interferon titers (when dextran sulfate is used) or to prolongation of interferon synthesis (when inosiplex is used). With inosiplex, the effect is a function of the dose of the inductor and the time of introduction relative to the immunomodulator. Inductors have many immunomodulating properties and act on cellular immunity, inhibiting delayed hypersensitivity, the rejection response of a transplant, and mitogen-dependent blast transformation. Using interferon inductors and immunomodulators together is felt to hold promise for the possibility of controlling the interferon system as well as for immune correction. Figures 6, references 29: 9 Russian, 20 Western.

UDC 616.155.3-008.13.616-006

### Effect of Synthetic Betaine Analogs on Macrophage Functional Activity

18400631 Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B:  
GEOLOGICHESKIYE, KHIMICHESKIYE I  
BIOLOGICHESKIYE NAUKI in Russian No 7, Jul 89  
(manuscript received 14 Feb 89) pp 71-74

[Article by V. K. Pozur, Ya. B. Blyum, V. V. Zgonnik, I. Ya. Kalvinsh, V. Ya. Kauss, P. T. Trapentsiyer, O. V. Pugovich, N. Ye. Kucherenko and E. Ya. Lukevits,

academician LatvSSR Academy of Sciences, Kiev State University; Institute of Organic Synthesis, LaSSR Academy of Sciences, Riga]

[Abstract] An analysis was conducted on the effects of betaine synthetic analog 3(2,2,2-trimethylhydrazinium-)propionate (I), thiadiazine betaine, and undecyl-I and pentadecyl-I and ethonium on phagocytic activity of mouse peritoneal macrophages. In vitro studies with the macrophages and *Staphylococcus aureus* and *Pseudomonas aeruginosa* demonstrated that the agents in question enhanced phagocytic activity by about 150%. These findings demonstrated that agents falling into this class of compounds may well have potential applications as nonspecific immunomodulators. Figures 1; references 12 (Russian).

UDC 616-006-092:615.371]-092.9:599.323.4

### Effect of Tularemia Vaccine on Tumors Induced by DMBA in Rats

18402131 Leningrad VOPROSY ONKOLOGII in Russian Vol 35 No 4, 89 (Manuscript received 21 Sep 87) pp 484-485

[Article by V. N. Zilfyan, V. A. Kumkumadzhan, A. K. Nersesyan, Oncologic Science Center imeni V. A. Fanardzhyan, Armenian Ministry of Public Health, Yerevan]

[Abstract] Various vaccines may inhibit, stimulate or have no influence on existing tumors. This article studies the influence of tularemia vaccine on DMBA-induced tumors in rats. Experiments were performed on 100 Wistar rats, males and females. On the sixtieth day after injection of the carcinogen, the animals were vaccinated (the vaccine was rubbed into to an epilated portion of the skin that had been broken by a smallpox-vaccination needle. Each rat was given one human dose of the vaccine. The tumor resistance of the rats was found to increase following a single vaccination. The vaccine increased all indices of phagocytic function of neutrophils and lysozyme activity while normalizing blood coagulation. References 12: 10 Russian, 2 Western.

### Experimental Investigation of an Allergen Isolated From Protein Fraction of Listeria Antigen

18402134a Dushanbe ZDRAVOOKHRANENIYE TADZHIKISTANA in Russian No 1, Jan-Feb 89  
(manuscript received 6 May 88 pp 78-89

[Article by P. R. Khashimova, L. A. Kondratyeva and N. P. Yelizarova, Tadzhik Scientific Research Institute of Epidemiology and Hygiene]

[Abstract] A protein fraction isolated earlier from *L. monocytogenes* antigens showed specific immunologic activity protecting experimental animals. After a heat treatment (in an autoclave) the protein fraction lost its immunogenic activity, but retained an allergenic property. The researchers here set out to determine the minimal dose of listeria culture that is capable of sensitizing rabbits and that can be detected by the allergen obtained. The experiments showed that 0.2 ml of the allergen containing 0.65 µg of the protein injected into 2.5 kg rabbits caused a threshold sensitization of the rabbits injected with a 375-million-microbe culture suspension. Intravenous injection of a 1-billion-microbe suspension was lethal, and a 250-million-microbe dose did not sensitize the animals. Next, the minimal dose of the allergen was determined for the threshold dose of the culture suspension, showing that 0.15 ml of the allergen containing 0.4 µg protein was the minimal dose detecting sensitization of 2.5 kg rabbits injected with a 375-million-microbe suspension. References 5: 4 Russian, 1 Western.

UDC 616-036.2

**Method of Determining Sensitization to Anthrax**

18400175 Kishinev ZDRAVOKHRANENIYE in Russian  
No 1, Jan-Feb 89 (manuscript received 10 Mar 88)  
pp 33-34

[Article by V. V. Gylka and E. N. Shlyakhov, Chair of Epidemiology, Kishinev Medical Institute]

[Abstract] Lymphocyte transformation tests were performed with a protective anthrax antigen to assess sensitization following subcutaneous immunization of guinea pigs with 10 million spores of a live anthrax vaccine. The studies on the 300-350 g guinea pigs revealed that the number of blast cells in immunized animals increased from 16.8% 4 days after immunization to 20.1% on day 7 and 26.8% on day 14. The number of positive animals increased correspondingly from 3/24 on day 4, to 13/24 on day 8, and to 18/24 on day 14. The percentage of lymphocytes undergoing blast transformation in control animals was 7.5%. Figures 1; references 5 (Russian).

UDC 613.166:622.34

**Clinical Manifestations of Chronic Hyperthermia  
in Miners Working in Deep Coal Mines**

*18402181B Kiev VRACHEBNOYE DELO in Russian  
No 5, May 89 (manuscript received 2 Nov 87)  
pp 104-106*

[Article by I. F. Peftiyev, V. A. Maksimovich, O. M. Golovneva and I. Ye. Mateyeva, Department of Occupational Pathology, Scientific Research Institute of

Labor Hygiene and Occupational Diseases, Oblast Clinical Hospital of Occupational Diseases, Donetsk]

[Abstract] Extensive medical examinations were performed on a total of 144 individuals working in deep coal mines. They ranged in age from 35 to 45 years, with an employment history of more than ten years. The purpose was to assess the health effects of long-term hyperthermia. The comprehensive studies demonstrated that prolonged exposure to this form of environment leads to vasomotor disorders and cardiovascular lability, as well as to the onset of neuroasthenia. References 8 (Russian).

UDC 613.22-006.6-089-06

**Intravascular Laser Blood Irradiation for Postoperative Complications in Laryngeal Cancer**

*18400463D Kiev ZHURNAL USHNYKH, NOSOVYKH I GORLOVYKH BOLEZNEY in Russian No 1, Jan-Feb 89 (manuscript received 26 May 88) pp 13-15*

[Article by I.Ya. Tsukerman, Z.D. Kitsmanyuk, V.A. Tselishchev, Yu. P. Burlak and V.B. Demochko, Department of Head and Neck Tumors, Scientific Research Institute of Oncology, Tomsk Scientific Center, USSR Academy of Medical Sciences]

[Abstract] Intravascular blood irradiation with a helium-neon laser (LG-75, 633 nm, 4-6 mW fiberoptic output) was employed in the treatment of 13 patients with pyogenic postsurgical complications of laryngeal cancer. The fiberoptic was introduced into the ulnar vein with irradiation conducted for 30 min/day for 5 days. The patients indicated an immediate subjective improvement complemented by abatement of fever in 11 patients after 2 to 4 treatments. After the complete course of treatment the areas of necrosis diminished, granulation and epithelialization were intensified, and treatment period was reduced by 7-10 days in comparison with conventional management. Blood examinations showed that intravascular irradiation led to a marked increase in total leukocyte counts, killer cells, and medium and blast forms of lymphocytes, a change that persisted for 24 h after a treatment. These factors were felt to play a significant role in attenuating the course of the pyogenic complications. Tables 1; references 12: 10 Russian, 2 Western.

UDC 616.33-002.44-089:616.833.191-089.85-059:615.849.19/-089.168:[616.33-018.7+616.33-008.87

**Effects of Chronic Gastric Ulcer Irradiation with Helium-Neon Laser and Vagotomy on Gastric Microflora and Cytology**

*18400463B Moscow BYULLEHEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 107 No 1, Jan 89 (manuscript received 20 Feb 88) pp 106-108*

[Article by I.M. Baybekov, R. Sh. Mavlyan-Khodzhayev and E. Sh. Musayev, Laboratory of Pathologic Anatomy, Tashkent Branch, All-Union Scientific Surgical Center, USSR Academy of Medical Sciences]

[Abstract] Studies conducted on Wistar rats with experimentally induced gastric ulcers showed that this form of pathology induced well-defined cytologic changes in the gastric tissues. The percentage of chief cells increased from a control value of 30.8% to 37.3% after induction, while the percentage of parietal cells shifted from 34.4 to 40.3%. Concomitantly, the counts of mucous cells decreased from 24.8 to 11.0%. Vagotomy in control rats led to a decrease in both the chief and parietal cells 60 days after the operation, to 25.6 and 29.1%, respectively,

and an increase of mucous cells to 31.7%. In rats with gastric ulcers vagotomy had a similar effect, resulting in normalization of the gastric cell pattern. However, ultrastructural evidence was obtained which indicated that their specific secretory functions and differentiation were disturbed. Gastric microflora showed elevated counts in gastric ulcers and following vagotomy. Helium-neon laser irradiation of the lesions with energies of  $20 \text{ J/cm}^2$  for 3 min three times resulted in some degree of restitution of normal differentiation patterns, and attenuation of gastric microflora, particularly in the fundus. Figures 4; tables 1; references 14: 11 Russian, 3 Western.

UDC 616.329-001.37-089:615.849.19

**Endoscopic Laser Treatment of Esophageal Chemical Burns: Clinical-Pathologic Study**

*18400463C Moscow ARKHIV PATOLOGII in Russian Vol 51 No 1, Jan 89 (manuscript received 1 Mar 88) pp 20-26*

[Article by M.A. Sapozhnikova and A.V. Kovanev, Department of Pathologic Anatomy and of Emergency Endoscopic Examinations, Moscow Scientific Research Institute of Medical Emergencies imeni N.V. Sklifosovskiy]

[Abstract] Histopathologic and endoscopic examinations were conducted on 34 male and female patients, 16 to 68 years old, to monitor the efficacy of helium-neon laser (LG-75, 0.63  $\mu$ ) therapy of esophageal chemical burns. The patients were irradiated three to 15 times, depending on the extent of the lesions. The clinical and biopsy materials demonstrated that laser therapy was effective in controlling edema and inflammation and in accelerating the healing process. A key benefit of laser therapy was the fact that thick scar tissue was not formed and esophageal deformations were thus avoided. However, indirect morphological information was obtained that inflammatory changes in the subepithelial layers persisted for at least a year. The conclusion was that helium-neon laser therapy should be incorporated into the management of esophageal chemical burns. Figures 2; references 23: 19 Russian, 4 Western.

UDC 615.849.19.015.4:612.35].07

**Effects of Combination of Semiconductor IR Laser and Magnetic Field on Liver**

*Moscow KHIRURGIYA in Russian No 1, Jan 89 (manuscript received 24 Mar 88) pp 85-88*

[Article by N.P. Mikayelyan, cand. biol. sci., I.M. Aliyev, I.V. Stupin, professor, G.G. Belous and Z.I. Ilyina, Interfaculty Laboratory Complex, 2nd Moscow Medical Institute imeni N.I. Pirogov]

[Abstract] Rabbits were employed in a study designed to evaluate the effects of percutaneous semiconductor IR laser (15 mW, 0.8  $\mu$  wavelength) and permanent magnetic field (20-35 mGs) on hepatic function, either

separately or in combination. Laser irradiation was continued for 20 days, with delivery of  $0.9 \text{ J/cm}^2$  per 3 min session per day; magnetic field exposure was continued for an identical length of time with 3 min exposures. Monitoring of serum enzymes, glucose, lipid, and protein levels demonstrated that the initial changes that were observed became stabilized after 10 days, showing relatively little change thereafter. The changes with either factor when employed in isolation consisted of increased alanine and aspartate transaminases, hypoproteinemia, hypolipidemia, and activation of lipid peroxidation. After 20 days hypoproteinemia persisted, but the other changes became attenuated to an increasing degree. The major feature of combined laser and magnetic field effects consisted of elevation of serum glucose and lipids and a relatively stable concentration of malonic dialdehyde showing some tendency to reduction. The latter observation suggesting neutralization of free radical reactions. These findings support the view that semiconductor IR lasers with a constant magnetic field should be employed in the treatment of hepatic insufficiency in order to avoid further perturbations. Figures 3; tables 1; references 8 (Russian).

UDC 617.7:615.033-085.849.19

#### Effects of Lasers on Drug Permeability of Ocular Tissues

18400480C Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 8, 88 pp 484-487

[Article by G.A. Kiselev, professor, O.I. Lebedev and V.S. Pospelov, cand. med. sci., A.V. Lukoshkin, junior scientific fellow, L.S. Gorbacheva, senior technician, and G.L. Styrt, physician, Chair of Eye diseases, Omsk Medical Institute]

[Abstract] Experimental trials were conducted on 2.5-3.0 kg chinchilla rabbits to determine the effects of laser radiation on drug permeability of various ocular tissues. The effects of helium-neon laser (2 mW) irradiation were assessed in terms of permeability of the various tissues, using either intravenous administration of streptomycin-S-35 or tritiated deoxyuridine or their application to the sclera or cornea as drug-bearing gels. The resultant data demonstrated that permeability of the corneal tissues was higher than that of the sclera, and that laser irradiation potentiated permeability. In addition, laser action also facilitated drug transfer across the eye-blood barrier by ca. 286%. Determinations of the effects of laser action on catalase and superoxide dismutase activities in the various target tissues suggested that the effects of laser irradiation were predicated on enhancement of tissue lipid peroxidation, as well as in a direct effect on mobility of drugs enclosed in the gels. Tables 3; references 15 (Russian).

UDC 617.735+617.7-007.681-021.5-085.849.19

#### Transscleral Coagulation of Retina and Ciliary Body with YAD-Nd Laser Odessa

18400480B OFTALMOLOGICHESKIY ZHURNAL in Russian No 7, 1988 (manuscript received 5 Jan 88) pp 408-411

[Article by T. Kenchik, professor, L.A. Linnik, professor, A.I. Kolomiyets, and V. Charnetski, cand. med. sci., Chair and Clinic of Eye Diseases, Warsaw Medical Academy; Odessa Order of the Red Banner of Labor Scientific Research Institute of Eye Diseases and Tissue Therapy imeni Acad. V.P. Filatov]

[Abstract] Transscleral laser coagulation is generally accepted as one of the more advanced applications of lasers in ophthalmology. However, the absence of specialized laser equipment has hindered wider use of this approach. To meet this need, the Warsaw Institute of Microwave and Laser Systems has constructed a portable YAG-Nd laser especially designed for transscleral coagulation. Clinical trials were conducted on 40 patients: ten with peripheral retinal detachment and retinoschisis, and thirty with secondary glaucoma. Treatment of the former group with energies of 0.06-0.12 J (700  $\mu\text{sec}$  pulses, 1 Hz frequency) resulted in the immediate appearance of coagulated foci, with complete disappearance of edema in 7-10 days and evidence of pigmentation. Transscleral laser coagulation of the ciliary body for alleviation of ocular tension required energies on the order of 0.12-0.16 J, with energy levels below 0.12 J shown to be ineffective. The clinical results were variable. Five patients with intraocular hypertension of 40 mm Hg or higher failed to respond and required surgical intervention. In 18 patients the initial hypertension of 36.1 to 38.3 mm Hg eventually fell to an average of 23.1 mm Hg a month after treatment, with intervening fluctuations in pressure. Another seven patients (40.3 mm Hg) required two to three coagulation sessions at 2-3 day intervals to bring the pressure down to 25.0 mm Hg. These observations confirmed the essential safety and efficacy of transscleral laser coagulation in the management of retinal problems and secondary glaucoma, and the need for specialized instrumentation to make this approach feasible. Figures ; references 14: 10 Russian, 1 Polish, 3 Western.

UDC 617.735-007.281-085.849.19-053

#### Age-Related Changes in Energy Thresholds for Retinal Laser Coagulation

18400480A Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 6, 88 (manuscript received 15 Feb 88) pp 355-358

[Article by L.A. Linnik, professor, G.I. Zheltov, cand. physicomath. sci., V.N. Glazkov, scientific fellow, Ye. S. Pukhlik, junior scientific fellow, and A.P. Privalov, senior engineer, Odessa Order of the Red Banner of

Labor Scientific Research Institute of Eye Diseases and Tissue Therapy imeni Acad. V.P. Filatov]

[Abstract] Clinical studies were conducted on age-related changes in energy thresholds for retinal laser coagulation, based on the reported findings that optical transmission of the crystalline lens diminishes on aging and that the decrease is greater the shorter the wavelength. The comparative data were derived for a cohort of 60 patients ranging in age from 14 to 79 years. The laser therapy was indicated for peripheral retinoschisis, peripheral retinal degeneration, or post-traumatic chorioretinitis. The data demonstrated that the energy thresholds for photocoagulation of the fundus oculi increased exponentially with age. The most pronounced increase was seen with the blue-green (argon) laser. Under otherwise identical operating conditions the energy requirements for the young patients were on the order of 80-100 mW, whereas for the aged the corresponding figure was at the 400-450 mW level, i.e., a 4- to 4.5-fold increase. In the case of the YAG-Nd laser a 2.5- to 3-fold increase was found. The change was far less pronounced in studies with the ruby laser, where the energy threshold for the young was on the order of 3-3.5 mJ and for the old 5-5.5 mJ. In addition, while in the case of the ruby laser the increase in the threshold was directly related to diminished optical transmission of the ocular media, no such relationship was apparent for the other two laser modalities. The latter suggests that the aging retina

becomes more refractory to the action of the argon and YAG-Nd lasers. Figures 4; references 18: 8 Russian, 10 Western.

UDC 617.001.4-002.3-089:615.849.19

#### Treatment of Purulent Soft-Tissue Wounds With CO<sub>2</sub> Laser

18402179B Moscow KHIRURGIYA in Russian No 6, Jun 89 (manuscript received 12 Jan 88) pp 54-58

[Article by A. P. Dotsenko, professor, and V. A. Khodos, No 1 Chair of Surgical Diseases, Odessa Medical Institute imeni N. I. Pirogov]

[Abstract] A cohort of 229 patients with a variety of soft-tissue purulent conditions were managed in a conventional manner with and without inclusion of CO<sub>2</sub> laser treatment (Romashka-1; 400-500 J/cm<sup>2</sup>). In the group with laser treatment, the duration of hospitalization in the infectious ward was reduced by 2-2.5 days, in comparison with the control patients. The key advantage offered by laser coverage of the infectious foci was a marked reduction in bacterial counts after irradiation from a control level of about  $4 \times 10^6$  cells/g tissue to about 50 cells/g. In addition, stimulation of the healing process by laser irradiation was an additional parameter that facilitated earlier successful approximation by suturing. References 9: 7 Russian, 2 Western.

UDC 617-001.17-06:616.157-07

UDC 616.3-006.6-074:543.426]-089.15

### **Endotoxemia and Criteria for Its Objective Assessment in Burn Patients**

*18402180 Moscow KLINICHESKAYA MEDITSIINA in Russian Vol 47 No 5, May 89 (manuscript received 19 Apr 88) pp 128-131*

[Article by S. V. Smirnov, N. I. Gabrielyan, S. V. Ignatov and O. I. Belotserkovskaya, All-Union Hematological Scientific Center; Scientific Research Institute of Transplantation and Artificial Organs, USSR Ministry of Health, Moscow]

[Abstract] Serum concentration of intermediate molecular weight (IMW) molecules and distribution coefficient K (i.e., ratio of absorption level at 280 nm versus level at 254 nm) were assessed over a 10-day postburn period in two groups of burn patients differing in the index of severity (SI). Group I subjects had a mean SI of 33.3 U; three of the 17 patients in this group died. Group II consisted of 6 patients with a mean SI for the group of 114 U; all of the patients in this group succumbed. Correlation of the data on the IMW molecules and the K values in connection with the outcome and the information on the SI showed that the former two parameters accurately reflected the level of endogenous toxemia due to the IMW molecules. Serum levels of the IMW molecules remained higher for group II patients throughout the period of observations, while the K values (0.8-0.9 rel. U) on days 7-10 indicated a poor prognosis. These observations indicate that high concentrations of IMW molecules and relatively low K values provide objective criteria for clinical evaluation of burn patients. References 15: 12 Russian, 3 Western.

UDC 615.15:615.831.4/6-08

### **Development and Study of Techniques for Electrophoresis and Phonoresis of Dicynone (Ethamsylate)**

*18402144 Minsk ZDRAVOOKHRANENIYE BEGORUSSII in Russian No 4, Apr 89 (manuscript received 12 Jul 88) pp 54-57*

[Article by T. A. Imshenetskaya, Chair of Physiotherapy, Belorussian Institute of Postgraduate Medicine; Chair of Eye Diseases, No 10 Minsk Municipal Clinical Hospital]

[Abstract] The effects of electrophoretic (5-15 mA for 15 min) and phonoretic (0.6-0.8 W/cm<sup>2</sup> for 10 min) forces on Dicynone were determined to ascertain the suitability of these methods for drug delivery of this agent. Assessment of absorption spectra, hemostatic activity in rabbits, and transfer across cellophane membranes demonstrated that the procedures were essentially innocuous. The fact that phonoresis and cathodal electrophoresis may be used for Dicynone delivery was confirmed in an initial clinical trial in the management of intraocular hemorrhage. Figures 2; references 16 (Russian).

### **Fluorescent Laser Diagnosis of Metastasis of Cancer of Digestive Organs**

*18402132 Moscow KHIRURGIYA in Russian No 5, May 89 (manuscript received 24 Mar 87) pp 112-115*

[Article by V. I. Polsachev, Ye. V. Potemkina, N. N. Dzbanovskiy, A. T. Rakhimov and L. B. Rubin, No 1 Chair of Surgical Diseases, Moscow Medical Stomato-logical Institute imeni N. A. Semashko; Scientific Research Institute of Nuclear Physics, Moscow State University]

[Abstract] Trials were conducted with a laparoscopic method combined with fluorescent laser technology for diagnosis of disseminated malignancies of the digestive organs. The study was conducted on 102 patients with gastric cancer, 23 patients with colonic and rectal malignancies, and 3 patients with esophageal cancer, employing fluorescein (5.5-8.5 mg/kg) as the fluorescent label taken up by cancer cells and excitation with a laser emitting at 441 nm. Laser illumination of the organs and tissues led to ready identification of metastases on the basis of bright salad-like fluorescence. Only one case of diagnostic error was encountered as a result of a similar type of fluorescence exhibited by hepatic capsule hyaline. The method, tried here for the first time, was more sensitive than conventional laparoscopic examinations and revealed many hepatic lesions that would have otherwise been missed. Ascitic fluid was also observed to give bright fluorescence, allowing its detection even when present in minimal quantities. References 3 (Russian).

UDC 615.835.52

### **Efficacy of Aerosol Therapy Based on a Hypercapnic Gas Mixture**

*18402123 Kiev VRACHEBNOYE DELO in Russian No 4, Apr 89 (manuscript received 4 Feb 88) pp 77-79*

[Article by T. S. Lasitsa and N. A. Morozova, Clinical and Function Department, Kiev Scientific Research Institute of Phthisiatry and Pulmonology imeni F. G. Yanovskiy]

[Abstract] Trials conducted on 25 patients (15 with chronic obstructive bronchitis, 7 with pneumonia) showed that inhalation of 10 ml of 0.5% ephedrine with a hypercapnic gas mixture (2% CO<sub>2</sub>) represented the optimum delivery route. Incorporation of the 2% hypercapnic mixture promoted deeper penetration into the airways as a result of an increase in respiratory volume, without affecting the respiratory rate, gas composition, or the blood acid-base balance. Studies with a 1% hypercapnic mixture did not offer a telling benefit, while a 4% mixture induced hyperventilation after 3-5 min. References 3 (Russian).

UDC 615.381:616.085.246.9

**Mechanisms of the Effect of SCN-D Hemosorbent on Functional Capacity of Donor Blood Stored for Long Periods**

18400629 Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR. SERIYA B:  
*GEOLOGICHESKIYE, KHMICHESKIYE I BIOLOGICHESKIYE NAUKI* in Russian No 7, Jul 89  
 (manuscript received 27 Dec 88) pp 68-71

[Article by M. S. Povzhitkova, A. L. Belkin, K. A. Pendrak, N. T. Kartel, T. A. Tsisarenko, S. L. Medvedev, O. A. Savitskaya, Ya. F. Kovalyshyn and T. N. Oleynik, Institute of Oncological Problems, UkrSSR Academy of Sciences, Kiev]

[Abstract] One method of preventing post-transfusion complications arising from prolonged storage of the donated blood is sorption detoxification of the blood; carbon adsorbents have proven to be inefficient for this purpose. In the present work comparative analysis was carried out on two sorbents: SCN-4M and its hydroxyl derivative SCN-D. Both sorbents effectively removed toxic components from the blood: citrates, lactates, other mid-molecular compounds. However, the required correction of the acid-base status of the blood was achieved only on the SCN-D sorbent. Blood pH rose as a result of the sharp drop in pCO<sub>2</sub> and BE deficiency, and SBC rose threefold. Erythrocyte pH value increased in proportion to the increase in blood pH. Those parameters were unchanged, however, after blood perfusion through the SCN-4M sorbent. The normalization of the acid-base status and the electrolyte balance of the blood after perfusion through the SCN-D facilitated a more substantial recovery of the acid-transport function of erythrocytes than did perfusion through the SCN-4M. The sharp differences between the two sorbents were due to their chemical properties. The carbon in the SCN-4M sorbent is in a mixed (H<sup>+</sup>-Cl<sup>-</sup>) form with acidic pH. During perfusion of blood through this adsorbent, the H<sup>+</sup> ions are exchanged for Na<sup>+</sup> and K<sup>+</sup> ions, which leads to lower concentration of these electrolytes in the plasma and acidification of the blood. Increased chlorine ion concentration is stems from the exchange of that ion for citrate and lactate ions. The SCN-D hemosorbent is in the hydroxyl form (Na<sup>+</sup>-OH<sup>-</sup>), with alkaline pH values. During perfusion, acid ions are exchanged for OH<sup>-</sup>, and pH of the blood is elevated. This improves the morphologic and rheologic properties of erythrocytes and their ability to transport oxygen. References: 8 (Russian).

UDC 616.94-089+615.831.4/6:616:15

**UV Irradiation of Autologous Blood in Combined Treatment of Septicemia**

18402138B Baku AZERBAYDZHANSKII MEDITSINSKIY ZHURNAL in Russian No 4, Apr 89 pp 57-59

[Article by L. P. Butylin, N. N. Volobuyev, K. S. Tikhonov and M. B. Sinani, No 2 Chair of Surgical

Diseases, Crimean Order of the Red Banner of Labor Medical Institute, Simferopol]

[Abstract] UV irradiation of autologous blood and reinfusion was tested in the management of 24 cases (8 acute, 16 chronic) of septicemia. The therapeutic procedure consisted of withdrawal of 1.0-1.5 ml of venous blood, dilution with 15-20 ml preservative, and irradiation with UV light using the BOP-4 (254-265 nm) instrument. After irradiation for 5-8 min the blood was reinfused; the number of irradiation/reinfusion procedures ranged from 3 to 5 per day. In 6 of the acute cases subjective and objective benefits became immediately apparent. The two cases without benefit were represented by pancreatic necrosis, peritonitis, and intestinal fissures in which the therapy was implemented late in the disease process. Marked efficacy was also evident in 15 of the chronic cases of 1 to 5 years duration. Since these patients were treated with UV irradiation only and monitored for 1 to 3 years, the data provide further confirmation for the clinical usefulness of reinfusion of UV-irradiated autologous blood in acute and chronic case of septicemia. References 6 (Russian).

UDC 616.94-085.38.015.2:615.849.114

**X-ray Irradiation of Donor Blood in Combined Management of Purulent Conditions**

18402179A Moscow KHIRURGIYA in Russian No 6, Jun 89 (manuscript received 19 Feb 86) pp 46-51

[Article by A. S. Yermolov, professor, R. B. Mumladze, candidate of medical sciences, I. P. Korenkov, doctor of biological sciences, V. G. Andreyev, A. A. Belopolskiy and L. M. Alekseyeva, candidates of medical sciences, and T. A. Vasina, candidate of biological sciences, 3rd and 1st chairs of surgery and Department of Radiobiology and Radioprotection, Central Scientific Research Laboratory, Central Institute of Postgraduate Medicine, Moscow]

[Abstract] Therapeutic trials were conducted on the use of x-ray irradiated donor blood in the management of patients with various pyogenic conditions (infected wounds, postoperative complications, chronic osteomyelitis, peritonitis, peritoneal abscesses, pancreatic necrosis). The 65 male and female patients (16-60 years old) received transfusions of 250 ml of donor blood that had been irradiated in doses proportional to recipient's body weight (e.g., 150 Gy for 60 kg patient, 190 Gy for 75 kg, 280 Gy for 90 kg). Transfusion was followed by daily intramuscular administration of 10,000 U/kg penicillin, with the administration of other antibiotics discontinued 24 before transfusion. Transfusion of irradiated blood was followed by objective and subjective improvements in 2-3 days, including reduction of body temperature, and elevation of blood levels of IgA and IgM by 40% and of IgG by 50% seven days after transfusion. Any improvements seen with unirradiated blood was delayed until 6-7 days, with reduction in total blood immunoglobulin levels by 55-60% by day 7. In addition, transfusion

of irradiated blood affected penicillin pharmacokinetics, extending the levels of effective concentrations to 24-48 h after a single injection. The cure rate for patients treated with the irradiated blood was 63.09%. Clinical improvement was noted in 15.38%, while 13.84% failed to respond (largely osteomyelitis cases). The corresponding figures for control patients in whom irradiated blood was not employed were 81.3%, 18.7%, and 18.7%. Figures 1; references 3 (Russian).

UDC 615.388.03

### Blood Reinfusion Technique

18402179F Moscow KHIRURGIYA in Russian No 6, Jun 89 (manuscript received 5 Oct 87) pp 116-118

[Article by V. P. Sukhorukov and T. P. Zakharishchev, candidates of medical sciences, Kirov Scientific Research Institute of Hematology and Blood Transfusion]

[Abstract] Brief description is provided for a vacuum-pump device used for the collection of blood extravasated into operating fields for reinfusion. The system is designed to minimize damage to the formed elements and ensure low levels of free hemoglobin. To achieve these ends, irrigation of the operating wound is conducted with a heparinized preservative and the force of suction maintained at 0.1 atm to avoid turbulence and foaming. In clinical practice the system has been found effective in the recovery of 200 to 7,500 ml of blood for reinfusion with a free hemoglobin concentration of 4.3% or less. Figures 1; references 2 (Russian).

UDC 616-002.4-002.3-02:615.837.3

### Effect of Low- and Intermediate-Frequency Ultrasound on the Course of Purulent Wound Process

18402179D Moscow KHIRURGIYA in Russian No 6, Jun 89 (manuscript received 23 Feb 88) pp 62-65

[Article by Yu. I. Pavlov, candidate of medical sciences, No 2 Chair of Surgical Diseases, Chelyabinsk Medical Institute]

[Abstract] Therapeutic trials were conducted on the inclusion of ultrasound in the management of infected postoperative wounds following appendectomies. Analysis of the outcome in 231 patients in terms of the rate of healing, as well histological, laboratory and clinical observations, demonstrated that ultrasound can be a very important therapeutic adjunct, reducing hospitalization in the infectious ward 1.5- to 2-fold under optimal conditions. Treatment with sound waves consisted of low-frequency ultrasound (26.5 kHz for 3-5 min) in the first phase of the treatment and intermediate-frequency ultrasound treatment (830 kHz for 5 min) of the infected area in the second phase. Low-frequency ultrasound was found to reduce the  $pO_2$  in the irradiated

skin by 20.6%. Intermediate-frequency ultrasound promoted a cutaneous temperature rise of 0.5-0.6°C and an increase in skin  $pO_2$  of 26.8%. Inclusion of the sonic modality accelerated the healing process and enhanced the immune response, factors which, in conjunction with improved oxygenation, were felt to account for the more rapid wound healing. Figures 5; references 9: 8 Russian, 1 Western.

UDC 617.57/.58-001.4-002.4-089-059: [615.83+ 615.355: 577.152.344

### Treatment of Purulent, Necrotic Limb Wounds

18402179E Moscow KHIRURGIYA in Russian No 6, Jun 89 (manuscript received 6 Apr 87) pp 66-67

[Article by K. S. Ternovoy, Yu. S. Zhila and A. D. Bulakh, Kiev Scientific Research Institute of Orthopedics]

[Abstract] Assessment was conducted on the efficacy of various treatment modalities in the management of refractory purulent, necrotic wounds of upper and lower extremities in 158 male and female patients, ranging in age from 16 to 72 years. In the final analysis, management that combined proteases, carbon-based absorbent dressings, and He-Ne laser action ( $3 \text{ mW/cm}^2$  for 3 min, 25-30 times) was shown to be the treatment of choice promoting wound healing without the need for plastic surgery in 75% of the cases. In 25% of the cases, free skin graft was required because of the extent of necrosis. Patients with slow granulation were shown to benefit from hypobaric treatment (60-80 mm Hg below atmospheric pressure), which enhanced capillary circulation. An additional advantage of laser therapy consisted of the enhancement of microbial sensitivity to antibiotics by approx. 30%.

UDC 616-001-089

### Effect of Sorptive Wound Dressing on the Activity of Certain Enzymes and Inhibitors of the Kallikrein-Kinin System in the Context of the Dynamics of Traumatic Injury

18402117 Kiev KLINICHESKAYA KHIRURGIYA in Russian No 4, 89 (manuscript received 11 Jan 88) pp 32-34

[Article by Ye. V. Yeretskaya, C. I. Voyvanko, L. A. Sakhno and V. Yu. Ulchenko, Institute of Problems in Oncology imeni R. Ye. Kavetskiy, UkrSSR Academy of Sciences, Kiev]

[Abstract] Therapeutic trials were conducted on chin-chilla rabbits to determine the effects of an absorptive wound dressing based on fibrous active charcoal on serum serine proteinase, kallikrein, and antitrypsin activities and wound healing. The rabbits bore a surgical full-thickness  $11.57 +/- 0.95 \text{ cm}^2$  cutaneous wound. Monitoring of the animals for 21 days demonstrated that, on an overall basis, management of the wound with

the active charcoal dressing attenuated the degree of increase in the factors of interest to below the control level seen in animals treated with conventional dressing. Concomitantly, wound healing was accelerated in the experimental animals, complications were precluded, and virtually complete wound healing was seen in 21 days. In the control series, 100% of the animals developed complications, including phlegmonas in 33.8% of the cases and hepatic abscesses in 20.6% of rabbits; the mortality rate for the control rabbits was 33.8%.

UDC 616.711-001-089.22:615.47.03

### **External Hardware Fixation of the Spine in Treatment of Spinal Disease and Injury**

*18402133 Moscow SOVETSKAYA MEDITINKA in Russian No 4, 89 (Manuscript received 13 Jul 88) pp 35-37*

[Article by V. N. Lavrov, B. I. Byzov, Department of Skeletal Surgery, Moscow Scientific Research Institute of Tuberculosis, RSFSR Ministry of Public Health]

[Abstract] Surgical treatment of spinal injury may involve long postoperative confinement (4-6 months). Rehabilitation of patients following this long period of bed rest may require 6-8 months or longer. The use of nonfocal fixation of the surgical area by an apparatus developed by B. I. Byzov is a new development in this area. Reliable external stabilization of the spine allows patients to be activated five to ten days after surgery. This article reports on 358 patients with specific and nonspecific spondylitis and vertebral fractures. The early activation of the patients decreases the number of complications, reduces hospital treatment time, allows patients to get back to work sooner and decreases the number of patients who become permanent invalids. References 2 (Russian).

UDC 616-099-036.11:615.38.015.2+615.246.2

### **Hemodialysis and Hemosorption in Combined Management of Acute Poisoning**

*18402181A Kiev VRACHEBNOYE DELO in Russian No 5, May 89 (manuscript received 28 Jul 88) pp 102-104*

[Article by O. V. Kurashov, V. A. Trotsevich, V. N. Padalka, S. Ya. Terletskiy, A. F. Pomaz and E. B. Kechker, Municipal Clinical Medical Emergency Hospital, Kiev]

[Abstract] An analysis was conducted on the therapeutic efficacy of a combination of hemodialysis and hemosorption in the management of 50 patients, 16-80 years old, treated for intoxication with various chemical agents. The outcomes of a total of 44 hemosorption and 40 hemodialysis procedures provided the basis for the study. The clinical experience demonstrated that the combination of hemosorption with hemodialysis reduced the duration of the latter procedure to 2-3 h. In

addition, when both procedures were applied in the early "toxicogenic" phase of the disease, mortality was reduced to 12.3% (33 patients); whereas if this approach was delayed until the "somatogenic" phase, the mortality was 52.9% (17 patients). These observations demonstrated that extracorporeal detoxication is an effective therapeutic approach to chemical intoxications.

### **Hormonal Contraceptives**

*18400171 Moscow ZDOROVYE in Russian No 6, Jun 89 pp 15-16*

[Article by Ya. G. Zhukovskiy, candidate of medical sciences and chief physician of Women's Dispensary No 9, Moscow]

[Abstract] Although oral contraceptives have gained wide acceptance abroad, in the USSR they are relatively little used for birth control, because of a lack of understanding by the public and, in fact, a large segment of the medical profession. This lack of understanding is largely responsible for the fact that more than ten abortions are performed in the USSR every minute. The availability of new, highly selective, and safe hormonal contraceptives has to be popularized if this trend is to change, an effort that will require intense educational efforts. One Hungarian oral contraceptive—Rigevidon—is already available at Soviet pharmacies, and two new pills—Triziston and Trikvilar—from East Germany have become available in 1989. The latter contraceptives are available in different doses that are color coded for use during different parts of the menstrual cycle. The oral contraceptives are generally used for 1.5 to 2 years to allow family planning and, when used as recommended, have been shown to be safe and effective.

UDC 616.94-06:616.16-008.1-031:616-002-031.63]-085.382

### **Significance of Correction of Microcirculatory Disorders at Inflammatory Sites in Sepsis Treatment**

*18402179C Moscow KHIRURGIYA in Russian No 6, Jun 89 (manuscript received 30 Sep 86) pp 58-61*

[Article by Professor Ya. N. Shoykhet, Professor Yu. M. Dederer (deceased), and I. P. Roshchev, Chair of Surgical Diseases, Pediatrics Faculty, Altay Medical Institute, Barnaul]

[Abstract] A total of 94 male and female patients, 17 to 72 years old, with septicemic conditions were divided into groups managed by conventional surgical and other supportive procedures, with and without transfusion of fresh donor plasma preserved by freezing. The clinical experience demonstrated that inclusion of plasma infusion (200-300 ml 4-5 times at 1-2 day intervals) serving as a source of antithrombin-III reduced the mortality figure to 16.7%, from 45.8% in the control patients without plasma infusions. The beneficial effects of

plasma were attributed to control of disseminated intravascular coagulation and consequent improvement of microcirculation at sites of inflammation. The latter, in

conjunction with surgical intervention, enhanced antibiotic access to the lesions. Figures 2; references 15: 11 Russian, 4 Western.

## MICROBIOLOGY

UDC 579.8.017.7:546.59

**Study of Capability of Bacterial Cells to Accumulate Colloidal Gold**

*18400638B Moscow MIKROBIOLOGIYA in Russian Vol 58 No 2, Mar-Apr 89 (manuscript received 8 Dec 87) pp 265-270*

[Article by S. V. Garbara, L. G. Stepura, Z. R. Ulberg and N. V. Pertsov, Chemical Faculty, Moscow State University; Institute of Colloid Chemistry and Water Chemistry, UkrSSR Academy of Sciences, Kiev]

[Abstract] A comparative analysis was conducted on the capacity of fresh isolates and collection strains of Gram-positive and Gram-negative bacteria to adsorb finely dispersed gold. Considerable variation was encountered in the ability to accumulate gold by the various species of *Bacillus*, *Pseudomonas*, *Caulobacter*, *Selliberia*, *Hyphomicrobium*, and *Renobacter*. However, isolates from natural environments with elevated levels of colloidal gold displayed a greater degree of adsorption than did the collection strains. In general, *Bacillus* sp. demonstrated the highest affinity for gold, with the extent of adsorption shown by mixed cultures greatly exceeding that of monocultures. Figures 6; references 20: 14 Russian, 6 Western.

UDC 576.8.093.1

**Rapid Determination of Microbial Antibiotic Sensitivity by Laser Spectroscopy**

*18402154A Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian Vol 142 No 5, May 89 (manuscript received 9 Sep 88) pp 26-28*

[Article by M. I. Lytkin, M. S. Polyak, N. N. Petrov, V. P. Nikitin, L. I. Fateyeva, A. E. Fotiadis, G. S. Chepcheruk and A. N. Tulupov, Leningrad]

[Abstract] Cursory description is provided of a method based on laser spectroscopy for the rapid assessment of bacterial antibiotic susceptibility (Priority Declaration 4151132/14-161919, 06/09/86). The method represents a modification of the conventional serial tube dilution technique and is based on the use of laser LG-38 as the light source with light scattering measured by a photocathode of a suspension of bacteria exposed to a given antibiotic. Trials with 13 strains of staphylococci and *E. coli* isolated from a number of pyogenic conditions and 4 classes of antibiotics gave excellent agreement with results obtained with the tube dilution method. However, the laser technique provided results in 1 h or less, whereas 24 h was required for the conventional assay. References 6: 3 Russian, 3 Western.

UDC 543.426:632.937.15

**Fluorescence of *Bacillus thuringiensis* Induced by Anaerobic Conditions and Its Relationship to the Functional State of the Cell**

*18402178B Moscow BIOLOGICHESKIYE NAUKI in Russian No 5, May 89 (manuscript received 5 Nov 87) pp 85-89*

[Article by Ye. I. Yefimtsev and Ye. V. Shtannikova, All-Union Scientific Research Institute of Applied Microbiology]

[Abstract] An evaluation was conducted on the fluorescence characteristics of *Bacillus thuringiensis* in relation to its physiological status in order to determine the feasibility of using fluorescence in monitoring biotechnological processes. Comparison of live *E. coli* and *B. thuringiensis* cells revealed two fluorescence peaks at 440-445 and 510-515 nm in response to excitation with 340 nm irradiation. In *E. coli* the second peak was much more intense than in *B. thuringiensis*, demonstrating thereby metabolic differences between the two genera. The first peak has been shown to be due to reduced pyridine nucleotides and the second to oxidized flavoproteins. Measurement of the fluorescence spectra of *B. thuringiensis* at reduced partial pressure of oxygen and elevated partial pressure of carbon dioxide revealed marked differences in amplitude and shape of the fluorescence bands. These changes were due to different redox potentials of the pyridine nucleotides and the flavoproteins. Additional studies also demonstrated that the spectra were affected by elevation of the temperature to 45 and 70°C. In summary, these observations confirmed the fact that fluorescence induced by excitation at 340 nm reflects the redox status of *B. thuringiensis* and thus may be used to monitor its physiological status in biotechnology. Figures 5; references 11: 9 Russian, 2 Western.

UDC 577.151.45

**Efficiency of Permeation of Long-Chain Aliphatic Aldehydes Across Bacterial Membranes**

*18402126C Moscow BIOLOGICHESKIYE NAUKI in Russian No 4, 89 (manuscript received 4 Mar 88) pp 79-84*

[Article by V. A. Marganiya, Yu. A. Malkov and V. S. Danilov, Chair of Microbiology, Moscow State University]

[Abstract] In order to expand the use of bacterial bioluminescence as an analytical technique, an aldehyde-dependent mutant of *Beneckea harveyi* AM-111 was used to test the permeability of the bacterial cell wall to  $C_8-C_{16}$  aldehydes. Studies in 0.1 M phosphate buffer, pH 7.4, at 4°C showed that fluorescence intensity was inversely proportional to the length of the aliphatic chain, with the permeability ranging from  $20 \times 10^{-6}$  cm/sec with  $C_8$  to  $3.8 \times 10^{-6}$  for  $C_{16}$ . These observations

demonstrated that the aldehyde-dependent mutant bacterium could well serve as a highly sensitive sensor for aliphatic aldehydes. Figures 4; references 11: 5 Russian, 6 Western.

UDC 578.81.043

**Proteins of Phages of Methanotrophic Bacteria and Effect of Temperature and UV Light on Virions**

18400638D Moscow MIKROBIOLOGIYA in Russian Vol 58 No 2, Mar-Apr 89 (manuscript received 24 Nov 87) pp 305-311

[Article by F. M. Tyutikov, A. I. Turkin, Ye. V. Turkina, B. F. Poglavov, A. S. Kriviskiy (dec.) and V. I. Valuyev, All-Union Scientific Research Institute of Genetics and Selection of Industrial Microorganisms, Moscow; Institute of Biochemistry imeni A. N. Bakh, USSR Academy of Sciences, Moscow; Interfaculty Scientific Research Problem Laboratory of Molecular Biology and Bioorganic Chemistry imeni A. N. Belozerskiy, Moscow State University]

[Abstract] An analysis was conducted on thermal and UV inactivation of bacteriophages derived from methanotrophic bacteria to complement data available for more extensively investigate phages. Thermal inactivation data demonstrated that phages gb-2 and 63, isolated respectively from *Methylosinus trichosporium* and *Methylocystis* sp., were most susceptible to heat, showing complete inactivation at 80°C after 20 min. Phage cmf-1, isolated from *Flavobacterium gasotypicum*, was found to be most resistant, showing a threefold loss of activity after 20 min at 90°C. In the latter case, inactivation proceeded with an energy of activation of  $0.424 \times 10^3$  kcal as a first-order reaction over the temperature range of 40-70-80°C. Studies on UV inactivation showed that the phages could be classified on the basis of their susceptibility to 254 nm UV light. Phage cmf-1 was most refractory to inactivation by UV light: even with a dose of 1000 J/m<sup>2</sup> inactivation amounted to only half an order of magnitude. Analysis of virion protein patterns showed that phage cmf-1 possessed 20 protein fractions and phage 63, eleven. Figures 6; references 12: 6 Russian, 6 Western.

UDC 579.841.11-252.5

**Mutants of Naphthalene Biodegradation Plasmids Encoding Meta Pathway for Catechol Oxidation**

18400638C Moscow MIKROBIOLOGIYA in Russian Vol 58 No 2, Mar-Apr 89 (manuscript received 14 Dec 87) pp 298-304

[Article by A. N. Kulakova and A. M. Boronin, Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino]

[Abstract] Studies were conducted with *Pseudomonas putida* bearing plasmids PBS2, PBS216, PBS217, or

NPL-1 that lack the capacity for meta catabolism of catechol to determine whether the plasmids in question possess silent genes for the pathway. Use of culture media containing 2-methylnaphthalene (MN) as the sole source of carbon led to the isolation of mutant strains capable of growth. Conjugation studies and assessment of spontaneous mutants that lost the ability to grow on such media led to localization of the mutations on the plasmids rather than the bacterial chromosome. The corresponding mutant plasmids that allowed growth on MN media were shown to express catechol-2,3-dioxygenase activity, and were designated PBS101, PBS102, PBS103, and PBS105. These findings demonstrated that plasmids PBS2, PBS216, PBS217, and NPL-1 possess silent genes for the meta pathways that are activated by appropriate mutations. References 20: 12 Russian, 8 Western.

UDC 617-001-06:616-008.6-08:541.185

**Endotoxicosis in Severe Mechanical Trauma and Sorption Methods of Its Treatment**

18402154C Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian Vol 142 No 5, May 89 pp 61-63

[Article by S. D. Sheyanov, B. V. Shashkov and G. N. Tsybulyak, Chair of Military Field Surgery, Military Medical Academy imeni S. M. Kirov, Leningrad]

[Abstract] In view of the fact posttraumatic toxemia has been shown to be due to the rise of blood components with an MW of 500-5000 D, therapeutic assessment was conducted on several method of absorption treatment of patients that had sustained severe mechanical trauma. The results demonstrated that greatest beneficial effect was obtained with per os administration of finely granulated SKN activated carbon. The 102 patients managed in this manner (30-40 cm<sup>3</sup> t.i.d. for 2 weeks, 1.5-2 h before or after food intake) showed a reduction in the mortality rate to 3.92% from a control figure of 25.00% (72 patients), with a concomitant reduction in the incidence of complications to 30% (80% in control patients). Topical applications of absorbent-impregnated dressings in 38 patients reduced the mortality to 10.53% and the rate of complications to 73%. However, extracorporeal hemosorption (37 patients) was contraindicated in the early stages of posttraumatic toxemia, as indicated by a mortality for this group of 45.59%, and a 93% incidence of complications. References 8 (Russian).

UDC 617-001-06-02

**Complications in Trauma Cases: Incidence, Features, and Etiopathogenesis**

18402154D Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian Vol 142 No 5, May 89 (manuscript received 20 Nov 87) pp 64-68

[Article by K. Ya. Gurevich, L. N. Gubar, S. T. Sergeyev and A. Yu. Ushakov, Military Medical Academy imeni S. M. Kirov, Leningrad]

[Abstract] An analysis was conducted on risk factors predisposing to pyogenic and pulmonary complications in cases of severe mechanical trauma. The cohort under study consisted of 2,033 cases with crush injuries seen at the Military Academy. The mortality rate was 14.4% (293) within the first 2 weeks, followed by the loss of an additional 175 patients (8.6%) during a subsequent period of time. The deaths were primarily due to complications, which consisted predominantly of peritonitis, meningoencephalitis, wound infection, osteomyelitis, thrombophlebitis, sepsis, pneumonia and acute renal insufficiency (ARI). The incidence of purulent complications was 1.5- to 3-fold greater in patients with combined trauma than in patients with single injuries. In addition, the incidence of complications in the former patients was 16-25% higher than in the latter, and the incidence of pneumonia 3-fold higher. The statistical analysis also revealed that pyogenic and septic complication developed predominantly in patients that had sustained a blood loss equal to 40% or more of the circulating blood volume, and particularly in cases requiring more than 2 L of transfused blood. In addition, patients with early signs of toxemia were especially more susceptible to pyogenic/septic complications (38.6%) than were the remaining patients (19.2%). This study demonstrated that the factors that place these patients at a particular risk of serious complications are multiple trauma, pronounced blood loss, and the large blood transfusions used to manage the hypovolemia. References 5: 3 Russian, 2 Western.

UDC 616.5-001.4-089

#### Treatment of Infected Wounds with Pulsating Lavage

18402154B Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian Vol 142 No 5, May 89  
(manuscript received 24 Feb 88) pp 58-60

[Article by I. G. Peregudov, P. N. Zubarev, Yu. N. Yusupov, T. A. Terentyeva, M. V. Yepifanov and V. S. Aminov, Chair of Naval and Hospital Surgery, Chair of General Surgery, Military Medical Academy imeni S. M. Kirov, Leningrad]

[Abstract] Trials were conducted on the use of pulsating lavage in the management of infected wounds in 243 predominantly male patients. The results were assessed in terms of reduction in microbial contamination of the wound surface and the incidence of complications following the application of sutures. The data demonstrated that under optimum conditions treatment of the wound surface with a pulsating antibiotic solution was effective in reducing microbial contamination by an additional 2.23 orders of magnitude (or 186-fold) over the reduction obtained with conventional management. In addition, when used in conjunction with curettage, the percentage of uncomplicated healing cases after suturing rose to 94 from 71%, and was equally effective whether followed by plastic procedures or not. References 4: 2 Russian, 2 Western.

UDC 574.64

#### Luminescent Marine Bacteria as Research Subjects in Studies of Individual and Combined Actions of Heavy Metals

18402184C Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA in Russian No 2, Apr-Jun 89  
(manuscript received 21 Oct 87) pp 64-68

[Article by I. A. Zhodakov, G. A. Dallakyan and V. N. Maksimov]

[Abstract] Bioluminescence quenching studies were conducted on Photobacterium fischeri exposed to Zn, Co, Cd, and Cu and their combinations, to assess the indicator role of this bacterium. With the exception of Cu, the quenching kinetics with these metals followed conventional enzyme kinetics, suggesting a carrier mechanism for their transport into the cell interior. In terms of toxicity these heavy metals ranked as follows: Zn > Co > Cd. Analyses showed that combinations of these metals exerted a synergistic effect on *P. fischeri*. The studies involving Cu were nonconclusive in view of poor reproducibility. Figures 2; references 8: 3 Russian, 5 Western.

UDC 582.263.581.8

#### Content of Certain Nitrogenous Compounds in Biomass of Chlorella vulgaris Grown With Elevated Osmolarity

18402186B Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 2 Mar 89 (manuscript received 8 Aug 88) pp 6-8

[Article by V. A. Khramov, B. I. Bilmes and Ye. M. Ageyeva, Institute of Microbiology, UzSSR Academy of Sciences]

[Abstract] Chlorella vulgaris was grown in a medium supplemented with increasing concentrations of NaCl (0, 5, 15, 30 g/L) to assess the effects of high osmolarity on nitrogenous compounds in the biomass. The concentration of amine nitrogen and of ammonia was little affected. However, proline increased significantly in direct proportion to the concentration of NaCl, reaching a maximum of 67 mM/kg at 30 mg/L NaCl. Concomitantly, the concentration of arginine fell from 140 to 17 mM/kg in going from 0 to 30 mg/L NaCl. These observations indicate that arginine serves as the primary source for the synthesis of proline under conditions of high osmolarity, and that the size of the cellular arginine pool may be used as an indicator of stress. References 13; 5 Russian, 8 western.

**Use of Licorice Cake for Production of Protein Feed Yeasts**

18402185 Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIH NAUK in Russian No 2 Mar 89 (manuscript received 8 Feb 85) pp 28-33

[Article by K. Akmamedov, Kh. Annadurdyev, K. Dovletmuradov, S. I. Belenkiy and N. Denliyev, Turkmen State University imeni A. M. Gorkiy]

[Abstract] In view of the vast supplies of licorice in Turkmen SSR a study was undertaken to determine

the feasibility of using licorice cake as a medium for the cultivation of feed yeast *Candida scottii* KS-2. Trials with root hydrolysates showed that the product contained sufficient carbohydrates (1.0-1.1% reducing substances) to yield approximately 200 kg of dry yeast biomass per one ton of the cake. The yeast composition was approximately 50% protein, of which 70-75% was hydrolyzed by pepsin. The ash content of the yeast product was 6-7% and enriched in Fe, Ni, Cr, Mn, and Co. These findings point to licorice cake prepared from processed roots as a valuable growth medium for the production of feed yeasts. References 3 (Russian).

UDC 616-001.4-082:355(581)

**Organizational Aspects of Medical Care Given to  
Victims of Land Mine Explosions**

*18400619 Moscow VOYENNO-MEDITSINSKIY  
ZHURNAL in Russian No 4, Apr 89 pp 35-37*

[Article by V. Khabibi, chief of Central Military Hospital, minister of defense of Afghanistan, candidate of medical sciences, major general of medical corps; P. M. Nasanchuk, colonel of medical corps; A. I. Gritsanov, professor and colonel of medical corps; I. P. Minnullin, candidate of medical science, lieutenant colonel of medical corps; and M. Rakhman, senior lieutenant of medical corps]

[Abstract] The increasing use of various forms of land mines by the bandit forces in the war in Afghanistan has posed a new challenge to military and civilian medicine in Afghanistan, faced with the important task of rehabilitation of the handicapped military personnel. The latter represent highly experienced, well-trained, dedicated

and accomplished soldiers who constitute a hard-to-replace human military resource. The increasing use of land mines by the enemy has altered the casualty picture to such an extent that 30-35% of the casualties now fall into this category, versus figures of 1.9-7.5% about three years ago. As a result, the medical corps is strained to its limits to provide proper care and rehabilitation. Because of the lack of adequate facilities, two-thirds of the patients are assigned to the Central Military Hospital, with 60% reaching the hospitals in a near-critical or critical state. Inadequate means of transportation and poor roads are responsible for the fact that 53.7% of these cases are first seen after more than 24 h had elapsed from the time of the injury, while 42.4% are seen after 6 to 24 h. The shortage of traumatologists and orthopedists is reflected in the fact that the majority (66.8%) of the cases with fractures are managed by conventional treatment modalities, e.g., casts, rather by osteosynthesis (18.5%). There is, thus, urgent need for upgrading the clinical and organizational aspects of military medical care to meet the changing scene at the battlefield.

UDC 615.846.015.46:612.017.1].076.9

**Influence of Repeated Local Microwave Exposure  
on Immunohormonal Indices in Intact Animals**

*18402128 Moscow VOPROSY KURORTOLOGII  
FIZIOTERAPII I LECHEBNOY FIZICHESKOY  
KULTURY in Russian No 2, Mar-Apr 89 (Manuscript  
received 11 Aug 88) pp 54-57*

[Article by I. D. Frenkel, S. B. Pershin, Z. A. Sokolova,  
A. I. Galenchik, Ye. G. Korovkina, All-Union Science  
Center of Medical Rehabilitation and Physical Therapy,  
USSR Ministry of Public Health, Moscow]

[Abstract] A number of authors have demonstrated the possibility of immunomodulation by decimeter (microwave) electromagnetic radiation directed at the endocrine glands. Experiments on 135 rabbits involved irradiation of the thyroid and adrenal glands. Microwave irradiation of the thyroid was found to change the hormonal ratios in the animals after two exposures. Adrenal cortex activity dropped after two to eight procedures and normalized after exposure was stopped. The studies indicate that microwave radiation of the adrenals can change the functional activity of the endocrine glands. Proliferative processes in the lymph tissue were stimulated. References 7: 6 Russian, 1 Western.

UDC 582.734:581.6

**Study of Biological Activity of Phenol Complex of Agrimonia Asiatica**

*18402139B Alma-Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR in Russian No 2, Mar-Apr 89 pp 88-90*

[Article by T. V. Ryakhovskaya, G. G. Ushbayeva and M. K. Kukenov, Institute of Botany, KaSSR Academy of Sciences]

[Abstract] Trials were conducted on mice and rats to assess the potential antineoplastic spectrum of a phenol complex isolated from *Agrimonia asiatica* against transplanted tumor lines. Studies with maximum tolerable doses (200-250 mg/kg, i.p.) in 18-24 g (C57Bl/6 x CBA)F<sub>1</sub> mice and 100-134 g rats showed moderate activity against Walker's carcinoma, sarcoma-180, carcinoma-755, and Ehrlich's solid tumor. Growth of this perennial in Kazakhstan should ensure a readily available source for the phenols isolated from this plant, consisting of a variety of flavonoids (flavonols, flavan-3-oles) and coumarins. References 10: 9 Russian, 1 Western.

UDC 616.7-001-003.9

**Effects of Hexapeptide Dalargin on Reparative Processes in Posttraumatic Bone Marrow Changes**

*18402116A Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 3, Mar 89 (manuscript received 3 Dec 85) pp 70-71*

[Article by G. I. Lavrishcheva and N. T. Turgunov, Central Scientific Research Institute of Traumatology and Orthopedics imeni N. N. Pirogov, USSR Ministry of Health; Namangam Oblast General Hospital]

[Abstract] Microscopic monitoring was conducted on the regeneration of medullary canal tissues following disruption by a lavage of saline or novocaine in the long bones of rabbits. Although a statistical analysis was not performed, the impression was gained that treatment of the animals with dalargin (0.03 mg/kg/day, s.c., for 4 weeks) promoted regeneration of the bone marrow tissue and enhanced microcirculation. Positive effects of dalargin were detected within two weeks, much earlier than in untreated control animals. These observations suggest that dalargin-type peptides may have systemic bioregulatory effects.

UDC 616-006.3.04:612.115.12

**Effects of Doxorubicin and Doxorubicin-Heparin Complex on Metastasis of Sarcoma-45 and on Hemostasis Following Surgical Removal of Primary Tumor**

*18402184A Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA in Russian No 2, Apr-Jun 89 (manuscript received 2 Oct 86) pp 12-16*

[Article by T. M. Kalishevskaya, G. V. Bashkov, N. Yu. Repina and L. S. Modina]

[Abstract] Albino rats were employed in a study designed to assess the role of blood coagulation in cancer dissemination. The data demonstrated that intratesticular transplantation of sarcoma-45 cells was followed in eight days by marked enhancement of blood coagulation system and depression of anticoagulant mechanisms. Hemicastration to remove the primary tumor was followed initially by activation of anticoagulant mechanisms, with enhancement of coagulative mechanisms delayed to day 16. However, surgical removal of the primary tumor was also followed by exacerbation of the metastatic process. Administration of doxorubicin (800 µg/kg, total dose) to the hemcastrated mice attenuated the development of metastases and was accompanied by hypercoagulability and depression of anticoagulant factors. Furthermore, treatment of the castrated animals with a doxorubicin (800 µg/kg)/heparin (124 µg/kg) complex was even more effective than doxorubicin in attenuating metastases. Finally, metastases were completely inhibited by treatment of these animals with the doxorubicin/heparin complex and a trypsin/heparin complex—the latter to activate coagulation—in conjunction with the mild adrenergic stimulant aminazine. Figures 1; references 8: 4 Russian, 4 Western.

UDC 616.006.097

**Antineoplastic Activity of Certain Aziridine Derivatives**

*18400176 Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian Vol 42 No 2, Feb 89 (manuscript received 26 Jun 88) pp 161-163*

[Article by A. V. Kazaryan, M. G. Avetyan, L. G. Allaverdova, S. A. Papoyan and S. G. Matsoyan, Scientific Research Institute of Medical Radiology, ArSSR Ministry of Health]

[Abstract] Experimental therapeutic trials were conducted with 6 Aziridine (ethylenimine) derivatives to identify putative antineoplastic agents. The derivatives consisted of the following oxalates: N-α-ethoxybenzyl/Aziridine (EBA), N-α-propoxybenzyl/Aziridine, N-α-methoxybenzyl/Aziridine, N-α-butoxybenzyl/Aziridine, N-α-isobutoxybenzyl/Aziridine, and α-ethoxyparachlorobenzyl/Aziridine. Trials on albino, outbred 90-100 g rats bearing transplanted spindle-cell sarcoma-45 showed that EBA, the least toxic of the agents in question, displayed the greatest antineoplastic activity, inhibiting tumor growth by 70-80% when given in doses equal to between one-fifth and one-sixth of the LD<sub>50</sub> dose for albino mice (255 mg/kg). In addition, EBA was also active against a number of other tumors (Walker's 256 carcinoma, Pliss lymphosarcoma, Shvets leukemia, and sarcoma 37), inhibiting their development by 25-35%. References 7 (Russian).

UDC 615.451.234:547.953].07

**Properties of Magnetically Controlled Liposomes Bearing Curariform Agents**

18400609A Moscow FARMATSIYA in Russian Vol 38 No 3, May-Jun 89 (manuscript received 30 Jun 87) pp 20-23

[Article by R. N. Alyautdin, V. I. Filippov and A. Yu. Nemirovskiy, First Moscow Medical Institute imeni I. M. Sechenov; Institute of Chemical Physics, USSR Academy of Sciences, Moscow]

[Abstract] Liposomes bearing ferromagnetic particles and curariform agents were tested for stability and drug release under *in vitro* conditions. The cholesterol:phosphatidylcholine (2:7; 2:5; 1:1) liposomes were filled with diadonium (bis-quaternary ammonium compound bearing an adamantyl residue on the N atom), ditilin (suxamethonium; diadonium analog lacking the adamantyl moiety), and pyrocurin [sic] and dipyronium [sic], respectively the bis-tertiary and bis-quaternary derivatives of  $\alpha$ -truxillic acid. Assessment of the efficiency of encapsulation yielded values of 50, 58, 7, and 10%, respectively. Release studies in physiological saline demonstrated that for all the agents approximately 3% of the encapsulated drug was released within 24 h, with a total release of 5-7% over a 7-10 day period, a parameter that was not affected by the inclusion of ferromagnetic particles. Maximum drug release was obtained with liposomes in which the cholesterol:phosphatidylcholine ratio was 2:7. An increase in the cholesterol content attenuated the rate of drug release. Incubation of the loaded liposomes in human cerebrospinal fluid enhanced drug release approximately twofold, with a further twofold increase obtained by incubation in either human or rat whole blood or plasma. Figures 1; references 6: 4 Russian, 2 Western.

UDC 616-006

**Possibility of Enhancement of Therapeutic Efficacy of Antitumor Preparations**

18400640B Moscow IZVESTIYA AKADEMII NAUK SSSR; SERIYA BIOLOGICHESKAYA in Russian No 3, May-Jun 89 (manuscript received 12 Mar 88) pp 466-468

[Article by N. P. Konovalova, L. M. Volkova and A. V. Klochko, Institute of Chemical Physics, USSR Academy of Sciences, Moscow]

[Abstract] Trials were conducted with the effects of liver extracts of the Black Sea piked dogfish (*Acanthias vulgaris*) in prolonging the survival rates of inbred mice transplanted with various tumors and treated with anti-neoplastics. The various protocols demonstrated that the liver extract (obtained with 1.4% NaCl), given in a dose of 0.3 mg/kg, one to four times in conjunction with

cyclophosphamide or rubomycin potentiated the therapeutic benefits of the antineoplastic agents. The advantages of inclusion of the liver extract were evident with leukemia La cells, sarcoma P388, and melanoma B16. The impression was that the liver extract acted as an adjuvant, rather than exerting an antineoplastic effect in its own right. Figures 1; references 6 (Russian).

UDC 615.32:615.771.5/.6]-06:616-006.04-033.2

**Study of the Role of the Aggregation Function of Thrombocytes in the Mechanism of the Antimetastatic Action of *Scutellaria Baicalensis* Extract**

18402125C Leningrad VOPROSY ONKOLOGII in Russian Vol 35 No 3, 89 (manuscript received 22 Mar 88) pp 331-335

[Article by T. G. Razina, S. N. Uditsev, I. I. Tyutrin, T. G. Borovskaya, K. V. Yaremenko and O. B. Zapuskalova, Scientific Research Institute of Pharmacology, Tomsk Scientific Center, USSR Academy of Medical Sciences]

[Abstract] A study was conducted on the interrelationship between the antimetastatic efficacy of a 40% ethanol extract of *Scutellaria baicalensis* and its effects on platelet aggregation. The model system consisted of 150-180 g male Wistar rats bearing a transplanted Pliss lymphosarcoma. Administration of the extract (1 ml per os) was commenced 10 days after the transplantation of the malignant cells and continued for the duration of the experiment. Tumor growth was accompanied by extensive metastases in 100% of the control animals. Concomitantly, the tumor-bearing animals showed either diminished or enhanced platelet aggregation activity, with the latter accompanied by much more extensive metastases. Treatment with the extract diminished growth of the primary tumor and attenuated the rate of metastasis. In addition, the extract also "normalized" platelet aggregating activity. The effects of the extract on platelets was attributed to inhibition of platelet lipoxygenase activity. However, the mechanism of action of its antineoplastic activity remains enigmatic, although it may be attributed to adaptogenic mechanisms. References 11: 7 Russian, 4 Western.

**Effects of Kupir on Musculocutaneous Wound Healing**

18402116B Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 3, Mar 89 (manuscript received 9 Sep 87) pp 71-73

[Article by F. Kh. Seyfullin, Ye. Yu. Kinel, Z. Salikhodzhayev and N. D. Sadykova, Tashkent Pharmaceutical Institute]

[Abstract] An analysis was conducted on the efficacy of kupir, a copper-vitamin B coordination compound, in promoting healing of musculocutaneous wounds. Observations on 180-200 g rats with surgical lesions showed

that in animals treated subcutaneously with 0.5 mg/kg/day kupir for 15 days, complete healing required 9.76 days on the average, versus 16.1 days for untreated control animals. Histologic studies showed that kupir enhanced granulation, minimized the level of necrosis, and facilitated growth of muscle fibers. These findings suggest the usefulness of kupir in the management of postoperative wounds. Figures 1.

UDC 615.917:615.285.7].099

### Case of Acute Poisoning by Methyl Chloroformate

18400204 Moscow GIGIYENA TRUDA I  
PROFESSIONALNYYE ZABOLEVANIYA in Russian  
No 10, Oct 88 (manuscript received 6 Mar 87) pp 57-58

[Article by A. A. Penknovich, V. V. Anikin, Institute of Labor Hygiene and Occupational Diseases, Gorky]

[Text] Methylether of chloroformic acid, or methyl chloroformate (MCF), is used in organic synthesis and also as an admixture to HCN in aerosols for pest control and is a potent irritant of the respiratory tract and conjunctiva even in concentrations of 5 mg/m<sup>3</sup>. Deaths resulting from acute methyl chloroformate poisoning have been reported. Methyl chloroformate poisoning is accompanied by pulmonary edema, secondary bronchial pneumonia, tracheobronchitis, and bleeding in the stomach mucosa and duodenal mucosa.<sup>1</sup> A case of acute methyl chloroformate poisoning observed by us is worthy of attention.

Patient N., 46 years old, entered the clinic at the Gorky Scientific Research Institute of Labor Hygiene and Occupational Diseases on 17 December 1986. A considerable amount of methyl chloroformate fell upon his clothing while he was repairing an MCF pipeline. Some of it soaked through the clothing onto the skin of his back, and patient N. experienced itching and burning sensations. There were no symptoms of respiratory distress since he was wearing a respirator while working. While in the shower, where he was sent to wash off any liquid remaining on his skin, he noticed a pungent, suffocating odor coming from his contaminated clothing. He experienced a sharp pain in his eyes, lacrimation, and a tickling in the throat, and he began coughing. These conditions lasted for a total of 3-5 minutes. Over the next 4-5 hours, he felt alright. He did not seek medical care. Later, after returning home, he began to experience pain and a burning in his throat. He experienced chills and dyspnea and developed a cough that produced a small amount of mucous sputum. The medical personnel at the treatment-and-prevention facility to which the man went did not consider his condition to be very grave and, after giving him calcium chloride and dimedrol, sent him home. After those measures, the man's condition improved; but after some time, the symptoms mentioned above worsened. When the dyspnea began to progress and the cough worsened, he was taken to the clinic 22 hours after the incident.

Objective examination revealed a body temperature of 37.1°C. The patient was lucid, and the skin was clean, with ordinary color, and was quite moist. Throat and mouth were hyperemic, as were the vessels of the posterior wall of the pharynx. Pulmonary respiration was somewhat reduced, and a considerable amount of moist, fine bubbling rales were heard in the inferolateral sections of both lungs. Respiration rate was 20 per minute. Heart sounds were rhythmic, dull. Heart rate was 90 per minute, and arterial pressure was 135/80 mm of mercury. The abdomen was soft and not sensitive. Neither liver nor spleen was enlarged. Blood analysis revealed Hb 149 g/l, erythrocytes  $5.05 \times 10^{12}/l$ , color index 0.89, leukocytes  $11.6 \times 10^9/l$ , platelets 3%, plasma 87%, electrolytes 2%, lymphocytes 5%, monocytes 3%; ESR 3 mm/hour.

X-ray studies of the chest on the day of admission showed heterogeneous reduction of transparency of lung tissue due to highly pronounced amplification of the lung pattern throughout the middle and lower pulmonary fields on both sides and multiple small-focal and medium-focal shadows, with a tendency towards fusion. Roots were expanded and unstructured.

Data from the anamnesis, the clinical course of the disease and results of radiological study provided the basis for diagnosis: acute poisoning from inhalation of methyl chloroformate vapors and pulmonary edema.

The patient's condition improved by evening after treatment with prednisolone, eufillin and lasix intravenously. Twenty-four hours after hospitalization, respiration was harsh; rales were not heard. Respiration rate was 12/min. Heart sounds were rhythmic and clear; heart rate, 72 beats per minute; arterial pressure, 120/80 mm of mercury. X-rays showed pronounced positive dynamics in the form of reduction of intensity of shadowing and highly amplified lung pattern. On the 3d day after hospitalization, x-ray pictures showed a pulmonary field without focal or infiltrative changes. Single small-focal shadows were differentiated in the middle sections, and the roots are structured.

The observation indicates that even brief exposure to low concentrations of methyl chloroformate (based on possible entry through the skin) may produce toxic pulmonary edema, with a latent period (4-5 hours in this case). This may be accompanied by slightly pronounced irritation of the conjunctiva and upper respiratory tracts. Therefore, a person who has been exposed to the action of methyl chloroformate should be kept under medical observation for 12-18 hours, after which he may be released if there are no signs of developing pulmonary edema. Conclusions

1. Methyl chloroformate vapors produce a brief, pronounced irritating effect on the upper respiratory tracts and conjunctiva.
2. In the acute action of even relatively low concentrations of methyl chloroformate vapors, pulmonary edema may arise after a period of seeming well-being.

BIBLIOGRAPHY

1. Harmful Substances in Industry, edited by N. V. Lazarev, 7th edition, Leningrad, 1976, Vol 2, p 152.

COPYRIGHT: "Gigiyena truda i professionalnyye zabolеваний", 1988

UDC 615.2/.3.036.97

**Novel Approach to Enhancing Drug Efficacy**

18400609B Moscow FARMATSIYA in Russian Vol 38 No 3, May-Jun 89 (manuscript received 28 Jun 88) pp 38-42

[Article by N. I. Kaletina and N. Yu. Stazhkova, First Moscow Medical Institute imeni I. M. Sechenov]

[Abstract] A review is presented of glycosylation as a means of enhancing the therapeutic efficacy of selected drugs and concomitantly in mitigating their side effects and/or toxicity. The model system given particular attention concerned 70 N-glycosylated sulfanilamides using D-glucose, D-galactose, D-mannose, D-xylose, or D-ribose. The data showed that glycosylation with D-glucose enhanced antibacterial activity 6- to 10-fold,

while increasing 2- to 2.5-fold phagocytosis of staphylococci by rabbit phagocytes in tissue culture. In addition, the toxicity of the D-glucose and D-galactose congeners was markedly diminished in comparison with unglycosylated sulfanilamides, a fact attributed to loss of ability to form complexes with metals via the nitrogen of the aromatic amino group. The latter mechanism protected metal-dependent enzymes from inactivation, thus mitigating toxicity. The results with N-mannosides and N-xylosides were less impressive than with the D-glucosides and the D-galactosides, while the D-ribose congeners were ineffective due to the high rate of hydrolysis of the N-ribosides. In addition, further potentiation of antibacterial activity and attenuation of toxicity was obtained by complex formation between the glycosylated congeners and Zn, Co (II), Cu (II), and Fe (III) salts. However, the toxicity of clathrates was not affected and remained at the level of the unglycosylated sulfanilamides. In general, the therapeutic benefits of glycosylation were shown to be dependent on the carbohydrate moiety which facilitated physiological transport across membrane barriers, and the nature of the central atom having a key role in ligand function. The therapeutic effects of the metal complexes may be anticipated to depend on the trace element status of key organs. References 31: 22 Russian, 9 Western.

UDC 612.821

**Effect of Cyclic Enkephalin Analog on Neural Protein Levels in Rat Hippocampus in Acquisition of Conditioned Reflex of Bilateral Avoidance**  
*18402178A Moscow BIOLOGICHESKIYE NAUKI in Russian No 5, May 89 (manuscript received 14 Oct 87) pp 59-64*

[Article by O. L. Segal, V. N. Mats and I. V. Bobrova, Institute of Higher Nervous Activity and Neurophysiology, USSR Academy of Medical Sciences]

[Abstract] Male albino rats, 150-180 g in weight, were employed in shuttle-box training to assess the effects of a synthetic cyclic enkephalin analog IOS-708 on hippocampal cell protein levels. Cytointerferometric examination of fields CA-1 and CA-3 showed that the former did not sustain any significant change under any of the experimental conditions. However, administration of 10 µg was seen to exert a regulatory effect on protein metabolism in CA-3 cells. During acquisition of the conditioned response or unpaired presentation of the unconditioned and conditioned stimuli, protein levels in hippocampal cells increased. Administration of IOS-708 to control rats led to a reduction in the protein levels. These observations are in agreement with previous reports that physiological manifestations of enkephalin-like peptides in the different brain formations may require functional exertion, such as acquisition of a conditioned response. Figures 3; references 17: 11 Russian, 6 Western.

UDC 612.822

**Neural Ensemble (Idea, Experiment, Theory)**  
*18402121 Moscow USPEKHI FIZIOLOGICHESKIKH NAUK in Russian Vol 20, No 2, May-Jun 89 pp 75-95*

[Article by O. G. Chorayan, Chair of Human and Animal Physiology, Rostov University]

[Abstract] A survey of Soviet and Western literature on neural ensembles is presented, treating this concept as a fundamental factor underlying brain function. Both experimental and theoretical data and reasoning are presented for the concept of nerve cell cooperation that leads to identification of neural networks on the basis of function and structure. The probabilistic networks thus identified and defined provide for the full scope of neural plasticity seen in normal function, brain injury, and physiological adaptation. Electrophysiological studies at the organ and cell levels, in conjunction with computer simulation, analysis of drug effects, and assessment of temporal parameters, are expected to eventually provide a deeper understanding of the fine points of CNS function within the neural ensemble model. References 164: 81 Russian, 83 Western.

UDC 591.481+591.412

**Cardiac Effects of Opioid Peptide Dermorphin in Cold-Blooded and Warm-Blooded Animals**  
*18402184B Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA in Russian No 2, Apr-Jun 89 (manuscript received 30 Nov 87) pp 23-28*

[Article by N. A. Sokolova, L. D. Kuligina, V. G. Krasilnikova, V. I. Deygin, Ye. P. Yarova and I. P. Ashmarin]

[Abstract] A comparative study was conducted on the cardiac effects of dermorphin in cold-blooded (frog *Rana temporaria*) and warm-blooded (rats, rabbits) animals to further expand on the scope of activity of the endogenous opioids in the phylogenetic spectrum. The *in vitro* and *in situ* studies on the three species—based on monitoring of heart rate, cholinergic chronotropic effects, and conduction—demonstrated that dermorphin alters parasympathetic heart regulation via inhibition of conduction. The latter effect is attributable to activation of the cardiac opioid receptors and inhibition of acetylcholine effects at high doses. Accordingly, the data indicate that dermorphin exerts direct heart effects in addition to effects mediated via the CNS. Figures 4; references 13: 1 Russian, 12 Western.

**Modification of Serum Alkaline Phosphatase and  $\alpha$ -Amylase Activity in Modulation of State of Nervous System During Stress**

*18402187 Kishinev IZVESTIYA AKADEMII NAUK MOLDAVSKOY SSR; SERIYA BIOLOGICHESKIKH I KHMIMICHESKIKH NAUK in Russian No 1, Jan 89 (manuscript received 17 Mar 88) pp 63-67*

[Article by N. I. Guska, Institute of Zoology and Physiology, MSSR Academy of Sciences]

[Abstract] To determine the utility of serum  $\alpha$ -amylase (AL) and alkaline phosphatase (AP) as stress markers, the activities of these enzymes were determined in response to stress and to cholinergic and adrenergic blockers. The studies were conducted on male Wistar rats (180-200 g) subjected to either immobilization or exposure to temperature of -2°C in conjunction with administration of either atropine (0.2 mg/kg), benzohexonium (10 mg/kg), or propranolol (1.0-1.5 mg/kg). Immobilization resulted in twofold depression of AP activity, which correlated with histochemical changes in the intestinal AP isoenzyme, while the activity of AL increased. Hypothermia was accompanied by less pronounced changes. Administration of atropine and bezohexonium to block m-and n-cholinergic receptors protected the gastric mucosa and led to depression of AP activity, which was dependent on the type of stress and was less pronounced in immobilization. In all cases atropine and benzohexonium served to elevate AL activity. Administration of propranolol led to a

dose-dependent depression of AP and AL in control and, even more so, in stressed animals. Accordingly, these findings demonstrate that serum AP and AL activities may be used as stress markers. Figures 2; references 11: 10 Russian, 1 Western.

**Use of Ultraviolet Radiation to Adjust the Immune System and Decrease Morbidity Among Athletes**

*18402127 Moscow TEORIYA I PRAKTIKA FIZICHESKOY KULTURY in Russian No 4, 89 pp 48-50*

[Article by G. R. Gigineyshvili, R. S. Suzdalnitskiy, V. A. Levando, and N. I. Ilin, All-Union Center of Medical Rehabilitation and Physical Therapy; Central Scientific Research Institute of Medical and Biological Problems of Sports]

[Abstract] A study is made of the influence of UV radiation on the status of the immune system and morbidity among athletes. Levels of IgA, IgM, and IgG were studied in the blood and saliva of 41 athletes, 30 of whom were exposed to 15 sessions of UV irradiation. The radiation was found to stabilize the humoral and secretory immune system indicators, which dropped in the control group. The dose range studied spanned 5 biological doses to 28.5. Sympaticoadrenal system studies revealed that UV radiation increased the excretion of catecholamines in physical exercise. The authors conclude that that UV radiation provides new possibilities for bolstering the immune response in athletes.

UDC 616.281-07.617.761-009.24

**Methodological Bases for Evaluating the Vestibuloocular Reflex**

*18402129 Moscow VESTNIK OTORINOLARINGOLOGII in Russian No 3, May-Jun 89 (manuscript received 17 Aug 88) pp 16-21*

[Article by I. A. Sklyut and S. A. Likhachev, Laboratory of clinical otoneurology, Belorussian Scientific Research Institute of Neurology, Neurosurgery and Physical Medicine, Minsk]

[Abstract] Nystagmus in response to stimulation of the semi-circular canals begins with a slow phase resulting from the tonic vestibuloocular reflex (VOR). Nystagmus can be considered a reflex resulting from the interaction of the VOR and the fast component system that fragments the VOR and momentarily returns the eyes to the initial position. Severe injury to the truncus cerebri, which eliminates the fast component and results in "floating" eye movement, provides an opportunity for researchers to study VOR in its "pure" form. The authors elaborate a methodology for studying VOR that is based on the use of three programs of study: sinusoidal rotation of the test subject whose eyes are closed; study of VOR pressure when the test subject's eyes are fixed on an object moving with the rotating chair; and sinusoidal rotation with the test subject's eyes fixed on an immobile object. The researchers explain the use of a coefficient known in the foreign literature as "gain VOR" (ratio of maximum speed or amplitude of movement of the eyes to maximum speed of rotation of the chair). In the context of their work, they describe the coefficient ( $K_r$ , for coefficient of reflex response) as a relative value characterizing visual-vestibular interaction and the neurodynamic activity of the vestibular system. They also explain the use of the concept of VOR phase shift—the delay or lead of the oculomotor response in degrees relative to the stimulus responsible for the response. Figures 4; references 12: 10 Russian, 2 Western.

### **Interferon Discounted as Possible Transmission Agent of AIDS**

18402052 Moscow ZDOROVYE in Russian No 3, 89 p 11

[Article consists of comments by USSR Academy of Medical Sciences Academician Valentin Ivanovich Pokrovskiy, president of USSR Academy of Medical Sciences and chairman of the council of experts on the scientific problems of AIDS, under the rubric "We'll Explain It": "Interferon Is Above Suspicion"; first paragraph is excerpt from letter by N. Volodin, in Moscow; second paragraph is source introduction]

[Text] *"In one of the evening Moscow television broadcasts, a researcher from the Institute of Immunology said that AIDS could be transmitted in the transfusion of donor blood and through interferon. But in my family (as well as in others), interferon is a preventive agent used daily against colds and influenza. It's used by adults, and kids, and the elderly. Does that mean that we're all placing ourselves in horrible danger?!"*

**Our correspondent O. Zedayn asked USSR Academy of Medical Sciences Academician Valentin Ivanovich Pokrovskiy, president of USSR Academy of Medical Sciences and chairman of the council of experts on the scientific problems of AIDS, to comment on that letter.**

[Pokrovskiy]: First of all, I would like to reassure the television viewers and readers that there is no danger of infection with AIDS through human leukocytic interferon.

The technology for producing interferon involves the inactivation of viral contaminants that may have accidentally found their way into donor blood (that is, it is rendered harmless). That means, for example, herpes, influenza, and hepatitis B viruses. After all, they are much more resistant to various external influences than is the human immunodeficiency virus (HIV).

Fortunately, the AIDS agent is very "woundable." Direct sunlight, temperatures above 57°, and acidic media kill it. And one of the stages of interferon production—hydrolysis—takes place in a highly acidic medium. Thus, if donor blood were to contain the AIDS virus, the virus would definitely be destroyed in the process of interferon production. Special studies conducted by specialists of the USSR Academy of Medical Sciences Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya have confirmed that. They infected a leukocytic mass with the AIDS virus, and then from that they produced a batch of interferon. Analyses of the final preparation that used sensitive electron microscopy techniques showed that the HIV was destroyed and completely inactivated.

Data of the State Scientific Research Institute of Standardization and Control of Medical Biological Preparations imeni L. A. Tarasevich, where preparations made

from blood are strictly monitored, also indicate that interferon is not in danger of being contaminated by AIDS.

Unfortunately, I cannot say that about the transfusion of donor blood. The test systems that exist in the world today do not identify HIV in 100% of the time: the efficacy of foreign test systems is 98-99%, while that of our systems is 95-96%. Moreover, they are all designed to detect antibodies to the AIDS virus, whereas those antibodies don't show up in the body, as a rule, until 2-3 months after infection. And if a donor gives blood during that period, the existing diagnostic techniques will not be able to detect a virus carrier. In that situation, I think, especial significance attaches to the civic attitude of the donor himself: to his morals, his decency, and his responsibility for the health of other people. If the person knows that he had casual sexual relations that are questionable, he simply must refrain from giving blood and then go take a test for AIDS!

At present, all donors, without exception, are being tested for AIDS first of all. And if a donor turns out to be an HIV carrier, he is banned forever from any type of donorship.

In medicine, however, there have always been and will always be extreme situations in which vital indications call for direct transfusion of blood to be performed. To our great distress, cases have already been recorded in which that singularly necessary, life-saving measure led to infection with AIDS. For that reason, we are at present tightening up the requirements for direct transfusion of blood. It should be done only with under the severest—I stress, the severest—vital indications. And no matter how tragic the situation on the operating table, no matter how precious each second is, the blood that is transfused into the patient must be free of the AIDS virus!

Our job is to try to completely eliminate the possibility of HIV entering the body through donor blood. For that purpose, ever newer special diagnostic laboratories are being opened and outfitted with modern equipment, and the means and techniques of detecting AIDS are constantly being developed and improved.

UDC 616.351-006.6-089.168

### **Early Manifestation of Rectal Cancer**

18402125B Leningrad VOPROSY ONKOLOGII in Russian Vol 35 No 3, 89 (manuscript received 25 Jun 87) pp 312-318

[Article by R. A. Melnikov, D. P. Berezkin, V. I. Yekimov and V. K. Kovalev, Order of the Red Banner of Labor Scientific Research Institute of Oncology imeni Prof. N. N. Petrov, USSR Ministry of Health, Leningrad]

[Abstract] The stage at which a tumor is first diagnosed is an indication of diagnostic alertness and index of

suspicion. Accordingly, an analysis was conducted on the stage of initial diagnosis of rectal cancer in the USSR, based on data gathered from 35 oncology centers across the Soviet Union in comparison with the experience at the Institute of Oncology. Evaluation of 6,875 cases for the period 1968-1980 demonstrated that stage I cancer was diagnosed in 3.6% of the cases, while 5.9% of the cases were first diagnosed with a stage IIa (TNM stage Ib) "small" tumor, 3 cm or less in size. Organ-sparing surgery, including local resection, was performed in 57% of the cases. Analysis of the five-year survival statistics for surgically treated patients yielded a figure of 63% when using the data from across the USSR at the All-Union Center for the Study of Efficacy of Treatment of Malignant Tumors, and 74

when relying on the data of the Institute of Oncology. The discrepancy was apparently due to a low index of suspicion in the former case when faced with rectal cancer in its initial forms, and lack of appreciation of the full extent of dissemination. Accordingly, the data indicates that preinvasive forms of rectal carcinoma should be managed as vigorously as the apparently more advanced cases. Figures 3; references 13: 10 Russian, 3 Western.

UDC 616.33-006.6-036.8

#### Survival Rates for Stomach Cancer (Based on Data of the All-Union Center for the Study of Efficacy of Treatment of Malignant Tumors)

18402125A Leningrad VOPROSY ONKOLOGII in Russian Vol 35 No 3, 89 (manuscript received 15 Apr 87) pp 305-312

[Article by D. P. Berezkin, V. N. Filatov and V. I. Yekimov, Order of the Red Banner of Labor Scientific Research Institute of Oncology imeni Prof. N. N. Petrov, USSR Ministry of Health, Leningrad]

[Abstract] Data obtained from the various oncology centers in the USSR were analyzed to determine the five-year survival statistics for gastric cancer in the USSR for the period 1974-1980. The data demonstrated that the overall rate for all hospitalized patients was 11%, and the relative rate 13%. In terms of discharged patients the respective figures stood at 12 and 14%. The most efficacious form of radical treatment in the case of patients in stages I-II of the disease consisted of surgery alone (64% survival); in stage III patients best survival figures (48%) were obtained with combination of surgery and radiation treatment. Finally, the best survival figures for stage IV patients (6%) were obtained with radical surgery in combination with chemotherapy. On balance, the data demonstrated that the five-year survival rates for Soviet patients with gastric cancer are on par or are even slightly better than for patients in the USA. Figures 1; references 10: 4 Russian, 6 Western.

#### Incidence and Structure of Congenital Birth Defects in Neonates

18402136C Frunze ZDRAVOOKHRANENIYE KIRGIZII in Russian No 2, Mar-Apr 89 pp 43-44

[Article by Z. A. Nuruyeva, Osh Oblast General Pediatric Hospital]

[Abstract] Analysis of the statistical data for the period 1986-1987 showed that the incidence of congenital birth defects in the Osh Oblast stood at 3.7% (896/23,593 births), and that such pathology was responsible for 8.78% of childhood mortality. In terms of individual anomalies the data revealed that 11.0% of the cases involved the cardiovascular system, 37.5% the urogenital system, 31.0% the musculoskeletal system, 11.4% the gastrointestinal system, 2.1% the CNS, 3.1% ocular pathology, and 3.6% of the cases consisted of some other type of involvement. Since the data reported here differ to some extent from previous reports, it is necessary that studies on this problem adhere to the classification scheme developed at the Semashko institute in Moscow in order to insure uniform diagnostic criteria.

#### The Problem of the Day—Brucellosis

18402137A Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 3, Mar 89 pp 12-16

[Article is a roundtable discussion in which the following individuals took part: Professor Ye. S. Belozerov, doctor of medical sciences and rector of the Alma-Ata Medical Institute; Professor M. M. Rementsova, head of the department of brucellosis at the Institute of Epidemiology, Microbiology, and Infectious Diseases; Professor I. L. Kasatkina, Alma-Ata Medical Institute; Professor T. S. Sayduldin, doctor of veterinary sciences and head of the department of epizootiology of the Alma-Ata Zooveterinary Institute; K. B. Kurmanova, candidate of medical sciences and head of the brucellosis clinic at the Institute of Epidemiology, Microbiology, and Infectious Diseases; L. A. Mukovozova, candidate of medical sciences; N. Zh. Zhanuzakov, candidate of veterinary sciences and chief of the antiepidemic section of the Main Veterinary Administration of KaSSR Gosagroprom; and L. M. Teplyakova, infectious disease specialist in the infectious disease department of the Kaskelen Rayon Hospital]

[Abstract] A roundtable on the problem of brucellosis in Kazakhstan was organized by leading health workers and editors of this publication to address this problem of perennial concern. The topics under discussion dealt with classification of the bacteria, pathogenetic mechanisms, treatment, prevention, and control in domestic animals. Kazakhstan continues to have the highest incidence of brucellosis in the USSR, with 2,000 reports per year of acute cases and 4,500 to 5,000 ongoing chronic cases. In 99.5% of the cases the disease is due to *Br. melitensis* and *Br. ovis*, followed by *Br. abortus* in importance. To control the situation additional diagnostic centers have been established and vaccination of

domestic animals is practiced on an extensive scale. In addition, it has been proposed that patients with acute, subacute, and chronic forms be monitored for 2 years and treated with antibiotics as necessary.

UDC 616-082.4:658.52:011.56

### **Optimization of Oblast Hospital Management by Use of Hospital-Based Automatic Control System (ASU-STATSIONAR)**

*18402145C Moscow SOVETSKOYE  
ZDRAVOOKHRANENIYE in Russian No 4, 89  
(manuscript received 4 Feb 88) pp 44-45*

[Article by Yu. V. Popov, N. F. Ilyicheva and A. M. Shcheglova, Taldy-Kurgan Oblast Health Department; Alma-Ata Institute of Postgraduate Medicine, USSR Ministry of Health]

[Abstract] The comprehensive ASU-Statcionar program for hospital management encompasses both administrative and clinical procedures, promoting an efficient workflow by reducing manual recordkeeping and automating many other routine procedures. The greater scheduling efficiency in the clinical setting has already resulted in a reduction in the average hospital stay from 16.3 to 15.5 days, including a reduction of 3 days in the surgical department and of 2 days in otolaryngology. This alone has made it possible to hospitalize an additional 630 patients and to perform an additional 211 operations per year. Automation is also felt to have had a telling impact on the operation of the intensive care unit and contributed to a twofold reduction in the mortality of patients with myocardial infarction. More extensive utilization of ASU-Statcionar can be anticipated to further enhance the quality of health care offered at hospitals.

UDC 616-082.4:008(47+57)

### **Problems and Prospects of the Planning for Hospital-Based Health Care in USSR**

*18402145A Moscow SOVETSKOYE  
ZDRAVOOKHRANENIYE in Russian No 4, 89  
(manuscript received 26 Jan 88) pp 10-13*

[Article by V. P. Korchagin, N. A. Kravchenko, V. I. Yepifantsev and E. N. Matveyeva, All-Union Scientific Research Institute of Social Hygiene, Economics and Health Care Administration imeni N. A. Semashko, USSR Ministry of Health, Moscow]

[Abstract] An analysis was conducted on hospital-bed availability in the USSR in order to facilitate planning for the future and assess the necessary level of anticipated expenditures. The best data indicate that while the cost of providing one hospital bed in the USSR in the 1966-1979 period was 7,100 rubles, the figure had risen to 13,400 rubles in the 11th Five-Year Plan and is expected to require an investment of 25,000-70,000 rubles per bed by the year 2000. Prospective studies

based on demographic trends have also shown that by the year 2000 the hospital bed availability will have to reach 178.9 per 10,000 population to keep pace with needs. A further breakdown shows that 127.0 beds (71.0%) of this figure will have to be allocated to general and specialized hospitals for acute and chronic cases, 13.0 beds (7.2%) to nursing homes, and 38.9 beds (21.8%) to various social care facilities (i.e., rehabilitation facilities, health resorts, etc.). References 8: 5 Russian, 3 Western.

### **Medical and Sanitation Problems in the Aral Sea Region**

*18402137B Alma-Ata ZDRAVOOKHRANENIYE  
KAZAKHSTANA in Russian No 3, Mar 89 pp 75-76*

[Article by O. Petrova]

[Abstract] The collegium of the KaSSR Ministry of Health held a meeting in January 1989 to discuss the medical, sanitary, and ecological situation in the vicinity of the Aral Sea. The ecological disaster was predicated on diversion of the waters of the Syr Darya and Amu Darya rivers, which led to the virtual disappearance of the sea, desertification, dust storms, and other climatic changes. The climatic changes have had particularly serious sequelae in terms of communicable diseases transmitted by the diminished waters of the Syr Darya and Amu Darya rivers, requiring strong and immediate public health measures and expansion of health facilities. Special health regulations have been put into effect in the Kzyl-Orda Oblast, including provisions for the construction of 139 medical facilities. In response to the critical situation in the Aral Sea region an international movement has been founded—20th Century: The World and Ecology [sic]—to address just such issues of global concern. The collegium resolved to render all possible assistance to the health authorities and the population in the affected territory in overcoming the health threat this ecological disaster presents.

UDC 616-084.3:681.31]-082

### **KASMON as a Data Base for Assessing Public Health**

*18402019A Moscow SOVETSKOYE  
ZDRAVOOKHRANENIYE in Russian No 2, 89 pp  
36-40*

[Article by O. P. Mintser, S. A. Platonov, A. I. Spitkovskiy, and M. Ye. Salyuta, Kiev Institute of Postgraduate Medicine]

[Abstract] The main purpose of the mass health screenings that are conducted in the Soviet Union involves, among other things, the development of comprehensive indices for evaluating the state of health of individuals and of the population as a whole. The difficulty associated with that task stems from the manifold factors that affect health and from the fact that none of the indices used today (e.g., the various morbidity rates, mortality,

average lifespan) can serve as a criterion of the health of the population as a whole. Although other methods do produce rather adequate assessments of the health of groups, the protocol involved in performing the assessments is too complicated for widespread use. The authors feel that the level of public health needs to be assessed on the basis of one or several integral indices that are based on a single data base. They suggest that the KASMON system—an automated system developed in Latvia for performing mass preventive examinations of the public—is well suited for the job. The system is easy to use, is inexpensive, and contains the appropriate diagnostic information for mass health assessment. It identifies deviations in an individual's health in the context of a broad range of pathologies. The authors study the results of the examination of 1,385 patients in the prevention department of the No. 1 Polyclinic in the Kiev No. 1 Hospital, where the KASMON system is in operation. An index characterizing the level of health in six age-sex groups—a so-called index of deviations (ID)—was developed on the basis of the formula  $ID_A = a/b$ , in which  $ID_A$  is the index of deviations in a given age-sex group,  $a$  is the total number of referrals to specialists for all pathologies identified in the individuals of the age-sex group, and  $b$  is the number of individuals in the age-sex group. Corollary formulas are used to determine the referral rate for broken down by gender and for the population as a whole. Figures 1, references 3 (Russian).

614.2:008(47+57)

**Tasks of the Health Care Agencies and Institutions in Terms of Carrying Out the 'Basic Guidelines for the Development of Public Health Protection and the Restructuring of Health Care in the 12th Five-Year Plan and in the Period up to the Year 2000'**

18402018a Moscow SOVETSKOYE  
*ZDRAVOOKHRANENIYE* in Russian No 2, 89 pp 3-22

[Article by Ye. I. Chazov, USSR minister of health, is a paper read at the All-Union Congress of Physicians]

[Excerpt] [Passage omitted] It was only after the 27th party congress—which boldly and objectively uncovered phenomena that were alien to socialism and that were hindering the growth of the social sphere of our society—did health care acquire a priority that was backed up not merely by words, but also by deeds.

Not only were the reasons for the flaws in public health protection uncovered and made public, but also the party's strategy in this most important area of the country's social development was formulated in the "Basic Guidelines for the Development of Public Health Protection and the Restructuring of Health Care in the 12th Five-Year Plan and in the Period up to the Year 2000." In order to show the scale of the restructuring being done in the field of public health protection and the active position taken by the party in that question,

one can point out that more than 190 billion rubles will be allocated between now and 1995 for the execution of just three decrees familiar to you that were issued by the CPSS Central Committee and the USSR Council of Ministers and two major decrees issued last year by the USSR Council of Minister on providing the public with medicinal drugs and on developing stocks of medical equipment.

Unfortunately, not everyone always understands—indeed, they still don't understand—the grave situation that Soviet health care is in. And I must say right out that it was only the firm position taken by the Politburo and M. S. Gorbachev and the support of N. I. Ryzhkov that made it possible for us to receive not merely a general declaration with good intentions—like the declarations we received in the past—but a specific, constructive document that created the conditions necessary for the restructuring and improvement of Soviet health care. Those decisions are, above all, reviving the forgotten medical principle of the priority given to the social development of our society, in which the protection of public health is one of the most important factors.

The notion that the matter of public health protection is a matter not only for the medical profession, but also for every communist and every party committee inspires confidence in the success of the decrees that have been issued.

We consider the transfer of nearly 1,000 administrative buildings and former dachas, hotels, and receiving centers to the health care system as a sign of the concern of party and Soviet organizations for public health. With the paucity now typical of health care in terms of its material-technical base, that's a big help.

In discussing the problems associated with the restructuring of the system of health protection, I must say openly that tangible results can hardly be achieved without the active participation of local organs of Soviet power in that process. Unfortunately, some local Soviets have forgotten that their health care departments are not institutions of the USSR ministries of health or of the Union republics—they are executive committee departments through which the Soviets must carry out one of their primary functions, and that is to preserve the health and lives of the inhabitants of their region.

Just where do we begin the restructuring of the health care system? And how are the priorities determined in that process, and what are the priorities? First of all, we need to realize clearly that we cannot accomplish the tasks that have been set before us if radical changes aren't made in the system for planning, financing, and managing health care. Underlying those changes must be a change-over from extensive methods and indices to methods and indices that define quality of work and that evaluate it in terms of the ultimate results, that is, in terms of public health.

The most difficult task in that process involves the search for new standards and indices of the work done by

health care organs, individual groups, and every medical worker. Unfortunately, our economic science has not been objective about the economics of the social sphere. And the only thing that Soviet economists have supplied us with is a detailed description of the economics of health care in capitalist countries. And our sector science—social hygiene and health-care organizations led by their head institute, the Institute imeni N. A. Semashko, in which there aren't even any specialists to deal with this issue—isn't up to par.

So the search for new standards and criteria is being done in a virtually empty space. One thing is clear: the basis of finance, as in all other countries of the world, must be a principle in which a given portion of the national income is earmarked for the protection of public health. Distribution after that must be done by the USSR Gosplan, the USSR Ministry of Finance, the USSR State Committee for Labor and Social Problems, and the USSR Ministry of Health according to established, scientifically based standards. Those standards absolutely must be based on quality indices with material incentives for quality of work itself, and they must allow for regional features and the degree of development of health care in a given region. They must not be based on number of beds or number of visits to a polyclinic, as it's done now, but on population count. At present, Gosplan, the Ministry of Finance, and the State Committee for Labor and Social Problems are working with the Ministry of Health on new standards and indices.

The most important factor in the refinement of the system of health protection and in the improvement of the work done by health-care organs must be to encourage a high quality of work among medical personnel and to evaluate that work on the basis of the ultimate results. [passage omitted]

So why on earth can't we predict the ultimate results in terms of the preservation of public health and provide appropriate material incentives for their achievement?

In discussing the need to develop new indices for evaluating the activity of medical institutions and the impairment of the existing institutions, we should turn to the use of the bed space of hospitals. Nobody would argue, for example, that the last 25 years have seen many new diagnostic and treatment methods that could improve the treatment process and shorten the stays of patients in hospitals. But in fact, those stays have not been shortened. On the contrary, over that period of time, the average stay has increased to 16 days from 13.5. If you consider that in a year's time, the country's hospitals treat 73 million people and spend nearly 13 billion rubles on that treatment, then you can imagine the actual losses that the state and the health-care sector suffer because of the absence of incentives for greater efficiency in the treatment process and for intensifying that process. By the most modest estimates, we lose 340 million rubles every year as a result of flaws in the organization of hospital care. And it's not just money we're talking about

here. Think of how many more patients who need, for example, preventive treatment we could refer for hospital care!

There are still categorical opinions that in a humanistic sphere of our socialist society's activity like health care, one shouldn't think about money, or tie the treatment process to a special form of intradepartmental cost-accounting that calls for material incentive for certain quality indices of work, or compare the financial figures of one health-care institution with those of another. A reporter from one of the central newspapers who missed the point called even those kinds of interrelationships "commercial trafficking in patients." I'd like to turn his attention to the works of the Marxist-Leninist classics, if only to Lenin's program for creating hospital financial offices. I don't think V. I. Lenin and his comrades would have regarded the financial computations those offices made in terms of payment for treatment and recovery as "trafficking in health."

Today, at the suggestion of the RSFSR Ministry of Health and party and Soviet organizations in Leningrad, Kuybyshev, and Kemerovo, an experiment is being conducted in those regions in terms of new forms of planning, finance, and management of the health-care system.

The aim of the experiment is to improve public health protection by providing material incentives for quality of work to health-care organs and medical personnel in the context of efficient and effective use of all possible resources. We would like to emphasize once again that the basis of the experiment is not desire to raise the pay of medical personnel, but to effect an improvement in the indices of public health by means of improving the work done by health-care organs.

The experiment has just begun, its positive aspects have been identified, and there are specific shortcomings have are being corrected in the course of its performance. A search is being conducted in a number of regions of our country for other approaches to the organization of public health protection, and new suggestions are coming in. A commission has been created in the USSR Ministry of Health that is drawing inferences from the experience and reaching conclusions about various new approaches. [passage omitted]

A study is being made of new approaches to the organization of work at the institutional level in health care as well as at the physician's level. New quality indices, for example, have been proposed for the work done by health-care organs. An experiment has been completed that showed the effectiveness and efficiency of allowing physicians to issue sick leave for five days at a time and for up to 10 days in individual cases. It's the job of the All-Union Central Council of Trade Unions to strengthen the USSR Ministry of Health's proposal that that experience be extended to the entire country. Stepan Alekseyevich, that's the request of all physicians—and,

indeed, of most of our patients. Because it would enable us to cut the waiting lines in the clinics by 20%.

We will be scrutinizing very carefully the experience associated with the work of the district physician as family physicians. That experiment is under way in a number of regions of our country. We regard it as progressive and support its use; but at the same time, we recognize that its introduction is hindered in some places because of the absence of appropriate conditions and trained personnel.

In terms of new principles of health-care management, they are based primarily on decentralization, expansion of the rights of the heads of all local levels and groups, and democratization.

The battle against the bureaucracy in health care is of especial importance. The bureaucracy doesn't square well with medicine. In fact, it's the enemy of medicine, for it is what makes robots of physicians, with programmed, over-instructed thinking. It is what fosters poor skills in the physician and what leads to the absence of creative initiative in his work. The health-care bureaucracy has caused a lot of trouble. Fighting bureaucracy in the context of the system that has come about is no easy task even within the walls of the USSR Ministry of Health. But it's being done with vigor. Let me cite some figures: during the past year, we managed to cut the number of instructions and standardization documents from some 5,000 to about 2,500.

The physician must treat, must help the patient, and must not get caught up in a lot of scribbling and the writing of unnecessary reports. That's what the introduction of the formalized anamnesis, new prescription forms, and the health passport are aimed at.

Sometimes you hear the reproaches from people who say that not many bureaucrats have been removed in health-care management organs. I want to report to the delegates that a decision has been made to eliminate the rayon health departments in cities with a population of less than one million. In fact, the management apparatus itself will be one of the smallest in number in the country—a total of just 8,062 people.

As for the problems associated with the most efficient and effective forms of organizing medical care, I would like to emphasize the value in the creation of associations that are new for us, such as the Interbranch Scientific-Technical Complex Mikrokhirurgiya glaza [Microsurgery of the Eye], the All-Union Kurgan Scientific Center, the facility Vosstanovitel'naya travmatologiya i ortopediya [Rehabilitative Traumatology and Orthopedics], the Scientific-Production Association Mikrokhirurgiya glaza, the Vosstanovitel'naya travmatologiya facility, the Scientific-Production Association Stomatologiya, and the Ekran facility. They have various statuses and different principles of the organization of and remuneration for services. The Interbranch Scientific-Technical Complex Mikrokhirurgiya glaza is the most active of the facilities today and has received

widespread recognition. The principles underlying the operation of that association and the remuneration for the work its staff does are the best, and no other health-care institution has conditions quite like those at the association. The association receives 214 rubles from the state for each operation it performs. We'd be happy to create several associations operating on that principle among the sectors of medical care that are lagging the farthest behind. However, our attempts to set up, for example, the Soyuztransplant association for handling the most critical problems in organ transplantation—an area in which we lag behind the leading countries of the world—were not supported by the central economic organs. We hope that the USSR Council of Ministers will go back and look at that question again.

We're expecting a lot from the Stomatologiya scientific-production association, which includes not only scientific-research subdivisions, but also faculties for post-graduate medicine, as well as a stomatological materials plant in Kharkov. Production and use of new materials for dental treatment and dental prostheses are expected to get under way in a joint effort with foreign firms.

It's natural to ask the question, Will we solve the problems of health care just by restructuring the system for financing, planning, and managing it? Of course not. That is only one of many in a complex variety of issues that must be resolved if a radical change is to be achieved in the protection of public health. And above all, we must reinvigorate our work in the area of prevention. Or rather, we must radically change our relationship to it at all levels—from the district physician and shop physician to the health-care directors—and we must change the relationship between it and the party, Soviet, and economic organizations and the society as a whole.

Proclaimed the fundamental principle of Soviet health care, prevention—which played a large role in the first stage of development of health care in controlling epidemics—has gradually become overgrown with declarations, general slogans, and well-intentioned wishes and has in fact ceased to be the primary method in a vigorous campaign to preserve the health of the people. Let's substantiate those statements with some figures. Annually in our country, more than 2.5 million people fall sick with acute intestinal illnesses and viral hepatitis; more than 9,000 come down with typhoid. The economic losses, by the most modest estimates, amount to 800 million rubles a year. But forget the money: in 1987, nearly 25,000 people died from those diseases, most of them children.

Where do those diseases come from? From things like bad drinking water and bad, contaminated milk products and products of the meat-packing industry. And how could it be otherwise, when 25% of the dairy enterprises and 30% of the meat-packing enterprises do not follow health regulations?

We—by that I also mean our health-hygiene services, not to mention our entire corps of doctors—have put up

## PUBLIC HEALTH

JPRS-ULS-90-010  
2 July 1990

with such conditions for a long time. We've put up with the fact that some 160 km<sup>3</sup> of sewage are dumped into open reservoirs each year; we've put up with the fact that purification structures are operating at 75% capacity.

Take another example. We are searching for ways to prevent the death of mothers and congenital anomalies in children. But that doesn't require any big scientific elaborations. It's enough to just go to the facts. Today, among the 9.4 million individuals working at production facilities with deleterious working conditions, 30% are women; some 270,000 women work at jobs that involve heavy physical labor. That right there is one of the most significant reasons for complications in pregnancy and childbirth.

The health-hygiene service of the country should utter some firm remarks on all those problems. It, above all other services, stands for the protection of the health of the individual, and the well-being of our society depends largely on its work and principles.

The ramified system of the health-hygiene service of the USSR Ministry of Health includes 4,572 health-epidemiological stations, in which nearly 300,000 medical personnel are employed. The health-hygiene service does a great deal of work. Its alertness and principles have been elevated in recent years. But clearly not enough to handle the jobs that have been assigned. Strengthening of the material-technical base is required, and the development and introduction of new methods of analysis—especially rapid analysis—are needed. At present, the reworking of the Statutes on the State Health Inspection is drawing to a close, and the Health Code of the country is being developed. The main thing is to ensure that the ecological situation is monitored and that health-hygiene rules and regulations are adhered to.

I must say frankly that the country's present system for health education and health-hygiene training is outdated. The health education houses are not performing their primary function of teaching individuals—especially young people and children—about healthy lifestyles. The number of lectures given—they amount to millions across the country—is in direct opposition to the level of medical, hygienic, and sanitary knowledge possessed by the people. That's why we feel that, in cooperation with trade-union organizations, the recently created Soviet Charity and Health Fund, the Union of Societies of the Red Cross and the Red Crescent of the USSR, and other social organizations, we need to set up, in place of the health-education houses, health centers that will head the work in formulating healthy lifestyles. The issue needs to be approached creatively, without cliche, and it's important to enlist our youth. That's why the health centers need to have rooms for physical medicine and rooms for figure skating, why there must be lecture halls for young people and young families, why dieticians and specialists in autosuggestion must lead sessions there.

We cannot tolerate the fact that over the period that extends from the first grade to the eighth grade, the number of healthy children drops fourfold, the number of children with nearsightedness jumps to 30% from 3%, the number of children with neuropsychiatric disorders goes from 15% to 40%, and the number of children with gasteroenteric disease doubles. That's why we must work actively in the schools with the instructors. And it's gratifying that the State Committee for Public Education, which understands the situation that has come about, is ready to work hand in hand with the physicians. That's extremely important, in view of the growth of drug abuse and alcoholism among youth. It's a complex problem, and drugs alone won't solve it, as people who have little understanding of drug abuse and alcoholism sometimes try to suggest. It requires painstaking work in the teaching of what a healthy lifestyle is, work in which the medical profession must be joined by pedagogues, the Komsomol, organs of the Ministry of Internal Affairs, and, mainly, the public.

And that such work is the best prevention is evidenced by the fact that after our society chose the road of active battle against alcoholism, the morbidity associated with chronic forms of that serious illness dropped in 1987 by 6.5%, and the morbidity due to alcoholic psychoses fell by 17.4%. Some 33% of 4.6 million patients under observation have been in remission for more than a year. In just two years, the number of cases of death by accidental alcohol poisoning has dropped by almost 15,000.

Problems of prevention have become especially acute in connection with the prevalence of two noninfectious epidemics. I'm speaking of cardiovascular disease and oncological disease, which are responsible for 80% of the mortality and disability in our country.

We have already cited data on the possibilities of the prevention of cardiovascular disease. The same sorts of data can be cited with regard to oncological disease. If we were to cut the number of smokers in our country by 30%, we would save hundreds of thousands of lives.

Speaking of prevention, we cannot help but say something about the organization of primary medical care and about the district and shop medical service. Along with the country's health-hygiene service, it defines both the scale of preventive measures and their success. Not just on paper, but in fact, the district physician, the shop physician, and the school physician must be the vehicles of the leading methods of prevention and must ensure the shaping of healthy lifestyles. Today, they are involved primarily in treating diseases. The gist of the restructuring of their work must consist in their dealing more and more with healthy or relatively healthy people. That requires new organizational forms, new material incentives for evaluating the work of the physician in terms of the ultimate result—the state of health of the population assigned to him.

In discussing means of improving the protection of public health, we consider the strengthening of primary medical care to be the crucial component in that process. In the improvement of the activity of the outpatient polyclinic service—polyclinics, rural medical outpatient clinics, medical stations, emergency medical service—and in the elevation of the level of work and skills of the medical personnel of those facilities, we see reserves for a considerable lowering of morbidity, disability, and mortality, as well as a means of radically changing the situation that has come about in health care. The question is not a simple one. Today, some 40,000 outpatient-polyclinics are in operation in the country, and 75,000 therapeutic medical sections have been opened, as have 20,000 shop-based medical sections. Nearly 10 million people are seen in those facilities every day.

The ambulance service makes nearly 90 million calls every year. The success of the health-care sector as a whole and, to a considerable extent, the lives of millions of citizens of our country depend on how well that entire service operates. Unfortunately, its level of activity today doesn't suit us. The main problem is that the material-technical base and the procedural base of many of the stations of this service are weak. It's the misfortune rather than the fault of a considerable number of the medical personnel that the style of operation that has come about has led to a lowering of the skills of the physicians and has provided no incentive for improvement.

That's why today we are giving priority in the development of the health-care sector to the prehospital stage of medical care. It is here that a diagnosis of disease, especially in the early stages, must be made. Only in complex, exceptional cases must the patient be hospitalized for the purpose of diagnosis. To handle this task, it is being proposed that in the next 5-6 years the diagnostics base of the outpatient-polyclinic facilities be strengthened and that the network of consultation-diagnostic polyclinics be developed. There are nearly 200 of them in the country today. Between now and 1991, some 70 more such polyclinics are expected to open.

The diagnostic centers created by a decree of the USSR Council of Ministers should play an important role in the improvement of the quality of diagnosis and in the feasibility of the wide use of the most modern and advanced methods. Fourteen such centers will begin operation this year, and each of them—which are open daily, including Saturday, for 2-2.5 shifts—will be able to accommodate 600-1,000 patients a day. Between now and 1995, we must set up a total of 150 such centers. It's important that they operate at full capacity. Unfortunately, we medical people still involve ourselves too little with questions associated with the effective use of equipment, especially imported equipment. The utilization factor for equipment is no greater than 60%. How vexing and painful it is when you see an artificial kidney, a gastrofibroscope, or an ultrasound unit operating 3-4 hours in a clinic or medical unit, and sometimes not even

every day, while thousands of patients wait months for an examination or for treatment that involves use of such equipment.

You can't dismiss such facts when the administrations of institutions are leasing unique imported equipment to cooperatives that set a high price for the tests that are conducted. We vigorously support the creation of medical cooperatives, especially in areas that present problems for the health-care sector—rehabilitation, nursing, stomatology, cosmetology, development and manufacture of medical equipment, and ritual services. But at no time should cooperatives replace the fundamental principle associated with the protection of the health of the Soviet peoples—free, high-quality medical care. Of course, the easiest thing to do would be to set up cooperative use of the equipment instead of they themselves intensifying its use.

When today, according to a USSR Gosplan report, the USSR Council of Ministers has fully financed the entire personnel roster of health-care organs, no one can say there's no wage fund for arranging two-shift operation of unique equipment. We sternly warned health-care managers that unused or underused equipment would be transferred to other institutions. It has been suggested to organizations of Medtekhnika—which, in spite of criticism, continues to do a poor job of monitoring how much its equipment is operated—that they step up their monitoring of equipment operation.

In discussing means for improving the activity of institutions that provide primary medical care, special emphasis should be made of the need for the broad introduction of new forms of operation that have proved their worth—day hospitals, home care, team operations, and free choice of doctor.

A vigorous discussion has unfolded around the role of the medical units of enterprises and the shop-based service in the system of public health protection. It should be emphasized right off that that service, which has withstood the test of time, is an important component in the health-care system. In solving social problems, enterprises and labor collectives must think first of all of the health of their workers. Can we really tolerate the fact that today there are only 1,361 medical units attached to some 6,000 large enterprises? There is no doubt that the shop service must move toward a shop-district principle of operation in which the shop internist sees patients in the polyclinic and makes house calls to workers of his shop. Moreover, the medical units must be the primary link in the system for preventing and treating occupational diseases, which are not dropping in number in our country.

From the standpoint of the development of mass health screening, continuity in the primary component for protecting public health is important. According to the Basic Guidelines for restructuring health care, mass health screening must be done in two stages between now

## PUBLIC HEALTH

and 1995 as the material-technical base of the health-care sector is strengthened and as realistic conditions for its execution are created. But time waits for no one. We need to become more actively involved in solving that problem as guarantee of security and prevention, and early detection.

It's important in that process to get rid of red tape and administration by injunction and to develop a creative basis. Today, mass health screening is largely a formality; it is not geared toward producing a final result and is performed more for reporting purposes. In this country, nearly 3,000 prevention departments are in operation; 130 million people have undergone preventive examinations; and 65 million adults and adolescents, according to official figures, are under clinical observation. But the quality of that work, the ultimate result, may be judged by the fact that in 1987 some 28.2% of patients with malignant neoplasms were identified as stage III patients, and 21.4% were identified as stage IV patients—that is, every second oncology patient was identified as being in a situation in which the medical profession is virtually powerless to help. A crucial factor here is not merely the excessive importance attached to formalities in the work done by the primary component of medical care and the low skill levels of a certain segment of physicians in polyclinics, rural outpatient facilities, and medical units, but also the breach that has come about between that service and specialized care. In this country, there are 21 scientific-research institutes for oncology problems, 254 oncology clinics, and 3,500 oncology departments and offices, which employ 7,530 oncology specialists and 4,000 radiology specialists. But that whole powerful service is not geared to producing a final result, and it is responsible only for that which it receives from the primary component of the health-care sector. It is that very breach between the work of the primary medical care institutions and that of the specialty institutions, plus a weak material-technical base, that makes for high mortality rates associated with oncological diseases and high disability rates.

The same can be said of the cardiology service. After something of a drop in cardiovascular disease—which is the main cause of death and disability among the people of this country—the figures are beginning to rise again. And all that is taking place against a background of expanded clinical observation. Just what kind of clinical observation is it, when the disease indices are not improving, but are worsening? Apparently, the 18 scientific-research institutes dealing with problems of cardiology, the 65 clinics, and the 921 cardiological departments are still not providing enough guidance for the work done by the primary component. We're talking here about the possibilities of prevention and treatment of cardiovascular disease. We could save tens of thousands of lives every year if all the advances that have been achieved in cardiology were the property of a broad segment of physicians.

As for issues associated with the improvement of primary medical care, one must pay special heed to the state

of rural health care. Historically, a situation has come about in which, as in other segments of social life, the medical profession owes a big debt to rural people. If the health-care sector has generally developed on the basis of left-overs, within health care itself that principle reigned primarily in the village. Today 40% of the central rayon and district hospitals are located in dilapidated, converted sites. Some 27% of the rayon hospitals don't have sewerage, and 17% don't have plumbing. The USSR Gosagroprom is not carrying out the decree of the USSR Council of Ministers or its own decisions concerning the construction and placement of health-care facilities in the village. Questions dealing with the emergency medical service for rural people are being dealt with poorly, as is the development of mobile forms of medical care. Are rural physicians, because they're short of automobiles, going to have to return to the old, proven means of overland transportation—the horse? There certainly aren't any stables on the blueprints for medical facilities, just as there aren't any coachmen on the personnel rosters.

Along with the outdated material-technical base, no fewer problems arise in connection with the shortage of medical personnel in the village and their high turnover rate and their poor skills. Such a mound of problems have accumulated that the USSR Ministry of Health feels that it is advisable to set up a special All-Union conference next year on rural health care.

Finally, when it comes to primary medical care, one can't help but mention the need to strengthen and improve the emergency medical service. In spite of all our criticism of the state of that service, it is rightly considered the best in the world, and we simply can't imagine how we would be able to live and work without it. However, the unresolved questions and problems in it are no fewer than in all of health care. As for the structure of this service, most physicians and health-care organizers consider it necessary to gradually separate the ambulance service and emergency care. Large, well-equipped ambulance teams shouldn't be going out to give a cancer patient a pain-killing drug or to perform some procedure that a nurse at the polyclinic didn't have the time to do. Reestablishing emergency care stations would create opportunities for more effective and efficient use of the ambulance service. In turn, every so-called line team needs to be brought up to the level of the intensive-care team in terms of equipment and physician skills. That doesn't mean that we should destroy what has already been created—such as the specialized ambulance teams. Everything depends on what the local conditions are. We need to speed up the creation of the Skoraya pomoshch [ambulance service] association.

Taking regional differences into account is very important in the work done to protect the health of mothers and children. We have declared a great deal of success in that area, and we have enunciated a lot of slogans like "Only the best for the children. The children are the privileged class in our society." But when we delve deeply into the situation that has come about in terms of

protecting the health of children, it turns out that we lose five times as many children under the age of one as does Japan and 2.5 times as many as do the United States, England, and the FRG. It turns out that the material-technical base of maternity and pediatric facilities is in the very worst condition. Today we are 30,000 beds short of normal conditions for childbirth and 130,000 beds short of what's needed for proper treatment of sick children. In fact, the existing base of those facilities is, mildly speaking, in lamentable condition, when you consider that 25,000-bed pediatric hospitals are wearing out. Or look at our pediatric sanatoria: 21% of them were built before 1917 and 46% before 1940, and 30% of them do not even have sewerage.

When you consider the shortage of pediatric physicians, pediatric drugs, and special equipment, the mass of problems that must be solved quickly to radically change the situation that exists in the protection of children's health is understandable. We must clearly see that our approaches to solving that problem in regions with a high birthrate—Central Asia, Kazakhstan, a number of regions in the RSFSR, and Azerbaijan—must differ from approaches used in the Baltic region, Belorussia, and the Ukraine.

The CPSS Central Committee and the USSR Council of Ministers have assigned the task of solving the problems associated with the protection of mothers and children by 1995. That will be possible if we not only step up the work, but also enlist party, Soviet, and social organizations as our allies. In that regard, I would like to thank the V. I. Lenin Children's Fund, which, from the moment it was set up, joined the medical profession in fighting for children's health. Is the task placed before us doable? The data show that over eight months of this year, child mortality dropped from its 1987 level of 25.4 to 23.8, which means that the task is entirely realistic.

We're still not thinking enough of the health of mothers and the health of women. Every year, we lose more than 2,500 women in childbirth or during abortions. Unlike in other developed countries, the most widespread and most accessible method of family planning in our country is artificial interruption of pregnancy. For every 5.5 million births annually, there are 6.5 million abortions. Besides, performing the births in normal conditions with good anesthesia was impossible in some regions of our country. That's why questions of family planning and the widespread introduction of contraception are not just medical concerns—they're social problems, problems that have to do with how we regard women, and they should be solved immediately.

Along with the development and strengthening of the primary component of medical care and the expansion, intensification, and improvement of prevention and health screening, we need to quickly resolve questions associated with the improvement of specialized care for our people. The goal is to see to it that the citizens of our country are able to receive, in any region, high-quality specialized care that is on a par with the achievements of

modern science. It's not simple, such a task, and it will take time and materials, but it has to be done.

We have already spoke of how the oncology and cardiology services are lagging behind. Our traumatologists and orthopedists have just as many problems. A considerable segment of the population turns to them for help, when you consider that the number of injuries alone that are recorded every year is 18.5 million, and more than 60,000 people become disabled every year as a result of injury. Soviet traumatologists and orthopedists are pioneers in the development and clinical use of a whole array of new treatment methods. Twenty scientific-research institutes and more than 100 faculties for such problems are in operation in our country. You'd think that, with their help, the new methods would find widespread use. However, the overall level of traumatology, its material-technical base, and the condition of patient rehabilitation cannot satisfy us today. We need not just one Kurgan center, which at best can provide treatment for 15,000-20,000 out of 18.5 million, but an entire service that operates at a state-of-the-art level and has modern equipment and skilled personnel.

Many problems exist in the build-up and development of other specialized services—such as neurosurgery, endocrinology, microsurgery, neurology, urology, ophthalmology, and otorhinolaryngology.

We cannot tolerate the lag in the cardiac-surgery service. In 1987, only 6,122 open-heart surgeries were performed in our country, as opposed to some 140,000 in the United States. We need to strengthen the existing cardiac-surgery centers and to bring their work up to par.

We are clearly behind in the transplantation of organs, especially kidneys. Last year, only 500 kidney transplants were performed in our country, as opposed to 8,000 in the United States. Tens of thousands of patients could live if we developed hemodialysis centers to the fullest extent and created a donor service and centers for organ transplants. At present, we have 3.4 dialysis facilities for every one million people; whereas the United States has 200 per million, and FRG has 180.

New problems that are a potential threat to public health are always cropping up in medicine. I'm speaking primarily at this point about drug abuse and AIDS. Today, the country has a branched system network of drug abuse facilities that provide treatment not only for alcoholics, but also for drug abusers and toxic-substance abusers, the number of which is growing. Those who work in the 509 clinics and the 3,603 departments and offices must reexamine their methods and approaches the identification and treatment of drug abusers. Their stance is often passive, and their work often bears the features of mere formality. They need to broaden their cooperation with education facilities, the Ministry of Internal Affairs, the Komsomol, and other social organizations.

Today, some 400 AIDS testing laboratories have been opened in the country, domestic test kits have been developed, a great deal of research is being done, and all

## PUBLIC HEALTH

JPRS-ULS-90-010  
2 July 1990

blood donors are tested for the virus. A total of 81 USSR citizens have already been identified as AIDS virus carriers, and there is a real threat of its spread. We all need to be on the alert and actively work to see that our people are protected from this, the worst epidemic of the century.

Unfortunately, we're running into some big difficulties here. The decree of the CPSS Central Committee and the USSR Council of Ministers that calls for providing the health-care sector with disposable syringes may be breaking down. Of the 100 million syringes the industry was supposed to deliver to us this year, we have received only 4.5 million. Whether we receive 350 million next year is anybody's guess. The issue of supplying the country with condoms, the most important means of preventing AIDS, isn't being resolved.

In that regard, I must say that the USSR Council of Ministers has adopted special decrees that call for providing the health-care sector with drugs and medical equipment.

We're all quite familiar with the situation concerning the supply of drugs. Some 80% of our orders are being filled, but that figure is much lower for certain vitally important items. Drug purchases in Yugoslavia and Finland have been reduced. There is still an acute shortage of the most effective antibiotics, tuberculosis drugs, drugs for treating malignant diseases, x-ray contrast media, pediatric medicinal forms, etc. Insulin and certain vaccines are of poor quality. A shortage of drugs is greatest tragedy for the physician and the patient. For the physician because he knows he could help the individual, he could save the individual's health—but the shortage provides him with no opportunity to do so. It's a tragedy for the patient because he and his relatives are ready to give their all to save him, but there's nothing they can do. That's how the "black market" for drugs is born, because the soil is fertile for abuses. There is nothing more disgusting and cruel than speculation in drugs. We must strengthen our fight for purity among our ranks. But the Ministry of Internal Affairs, the procurator's office, and the judicial system must understand that theft of and speculation in drugs—in fact, any profit based on people's suffering—represent the most serious crime.

The USSR Council of Ministers has adopted a decree that sets assignments for industry in order to fully meet the needs of health care for drugs by 1993. Deliveries of cardiovascular drugs are growing every year. In 1989 and 1990, the problems involving the supply of contrast media should be solved, and deliveries of nitroglycerin preparations, glycosides for the heart, psychotropic drugs, modern broad-spectrum antibiotics, and blood substitutes will grow.

In the new conditions, we must organize the operations of our pharmacy service to be more precise. It does a great deal of work, considering that the volume of sales of drugs to the population amounts to 2.5 billion rubles a year, and the volume of sales to health-care institutions

is the same. Based on that, perhaps, the USSR Gosplan and other central agencies see the pharmacy service as ordinary commercial centers. We are categorically against such an approach to the pharmacies. The pharmacy is not a store, and its work must be assessed not in terms of production volume, not in terms of proceeds from sales, but in terms of how well the pharmacy meets the needs of the working people and the requests of sick people. Right now, the pharmacy service system is undergoing perestroika, and the All-Union association Farmatsiya is being created. It's more than just putting a new sign out front—it involves new approaches to work that are based on indices of quality, wide use of the computer, and a closer relationship with health-care institutions. We can't put up with the way things usually are with us—drugs sitting in warehouses and getting lost, while there's a shortage of them out in the system, or drugs sitting in containers for months because of a lack of warehouse space.

A problem that is even more complex than that of the drug supply involves supplying the health-care sector with modern medical equipment. Today in the United States, for example, more than 3,000 computerized tomography scanners are in operation, whereas only 62 are on line in our country—and 25 of them are of an outdated design that is used only for brain studies. But never mind the computerized tomography—we're short of even the simplest equipment: operating tables, drying-and-sterilization cabinets, and surgical and stomatological instruments. About 60% of the needs of health care in terms of equipment are being met, and only 30% of that equipment is modern.

In view of the current situation, the USSR Council of Ministers has adopted a special decree involving the provision of health care with modern medical equipment. That decree calls not only for the growth of equipment deliveries from the current level of 1 billion rubles to a level of 3.5 billion rubles in 1995, but also for the manufacture of equipment that meets modern needs. It calls for the start-up next year, for example, of the production of CT scanners in a joint venture with foreign firms at an enterprise of the Ministry of the Electrical Equipment Industry [Minelektrotekhprom]. An active role is being taken in the field of health care by the Ministry of Defense Industry, which is working jointly with the Japanese firm Olimpus on the improvement of fibroscope equipment; a state-of-the-art artificial kidney has been developed and put into production, a complex of optical equipment for ophthalmology has been developed, and production of surgical microscopes has been improved and expanded. A great deal is being done for medicine by the ministries of the radio industry, communications equipment industry, the electronic industry, and the shipbuilding industry. One would hope that our main supplier of equipment and instruments—the Ministry of Instrument Making, Automation Equipment, and Control Systems, which is responsible for some 60% of all deliveries—will take an active role in the development of the medical industry.

and the meeting of the needs of the health-care sector. The USSR Council of Ministers adopted a decision concerning the use of foreign firms to construct for the USSR Ministry of Health a large plant for the production of surgical tables, functional beds, and other medical equipment.

In the new conditions, when the cost of equipping a hospital bed with medical equipment will rise to 14,000 rubles from 7,000, the importance of the work of health care's engineering and technical corps, the Medtekhnika system, is growing. Its work at present is not suitable from an organizational standpoint or a quality standpoint. That's why the restructuring of that entire system must begin very soon. The system must take on the nature of a powerful technical and economic association with its own repair plants and its own branched network of maintenance service at a modern level.

In the restructuring and improvement of the protection of public health, an important role is slated for Soviet medical science. Its advances are indisputable. Many of the findings of the theoretical and clinical studies of Soviet scientists have long been in the depository of world science. The high level of our medical science is best evidenced by the fact that the scientists and governments of 19 of the most advanced capitalist countries—including the United States, Great Britain, the FRG, and France—have voiced their desire for and concluded agreements involving joint research with Soviet science centers.

However, with the new requirements for the health-care sector, the state of medical science and its contribution to practical medicine cannot satisfy us. The restructuring outlined last year at a session of the USSR Academy of Medical Sciences, particularly in the field of academy science, is going slowly.

Next year, medical science is changing over to new forms of financing and planning that are based on cost-accounting principles. The financing of the research program and the determination of priorities is done through 26 expert councils that include the country's leading scientists and that operate on a competitive basis with secret ballot. Such a system will make it possible to determine more precisely the priority directions to be taken and, in principle, to preclude subjectivism in the assessment of the scientific potential of a given institution and put up a barrier to monopoly in scientific areas.

But along with the productive councils such as the Council for Biotechnology and the Council for AIDS, there are many councils that work just with externals and try to make the old form of science planning fit the new conditions of cost accounting. Unfortunately, in some councils, unscrupulousness reigns, and questions are decided from a "you scratch my back, I'll scratch yours" slant, or "try not to offend anybody." With that kind of situation, greater control and greater scrupulousness must be taken by the presidium of the USSR Academy of Medical Sciences, which is responsible for developing

scientific research in the country. The question of the relationship between Union science and republic science in the new system of finance has not been resolved on the level of directive and financial organs. The situation that is developing is leading to a loss of the coordinating role of the USSR Ministry of Health and the USSR Academy of Medical Sciences in conducting scientific research. The question of remuneration for the work of the experts is unresolved.

As for specific science priorities, I must emphasize the necessity of strengthening work done in the area of basic research, in which we have begun to fall below the level of world science. We must strengthen research done in the area of viral diseases, where practical health care feels especially sharply the lag in the development of new, more effective, less reactive vaccines. More attention must be devoted to the execution of the recently created Gripp [Influenza] program. Its realization has a great deal of significance for the state if you consider that this year, for example, more than 19.5 million people fell ill to the epidemic, and the total losses suffered by the country amounted to 1.8 billion rubles.

The importance of scientific developments concerning AIDS goes without saying. Practical health care expects much from the scientific research involving problems of cardiology and oncology. I must emphasize the need not only for a greater concentration of manpower and equipment in priority directions taken in certain fields of medical science, but also the change-over to assessing the work of every scientific research associate on the basis of the ultimate result. Can we really tolerate the fact that, in spite of all our efforts, we have managed to cut back only 28 small, unpromising scientific-research institutes? We are meeting strong resistance here not only from the councils of ministers of the republics, but also from individual members of the USSR Academy of Medical Sciences and its presidium. Even the USSR Academy of Medical Sciences and the USSR Ministry of Health still have some institutes with only four or five doctors of sciences. Finally, can we really tolerate the fact that over the last three years, our 92,000 scientific and pedagogic workers have not given the practical health-care sector a single fundamentally new, original domestic drug or method of treatment?

Before us stands the task of seeing to it that by 1995, every patient in every part of our country get treatment that is on a par with the achievements of science. In addition to strengthening the material-technical base, we must speed up the transfer of scientific advances to practical medicine. The special introduction centers that are being created at state institutes for postgraduate medicine and scientific research institutes will serve that goal. It is through those very centers that new equipment and new drugs will be introduced and at those very centers that personnel will be properly trained.

The system for approval and certification of new equipment and drugs in the USSR Ministry of Health has been completely reexamined, and the time frames for that

process have been precisely established. We feel that it is important for local health-care organs to provide material incentive for the introduction of new methods of operation in polyclinics, hospitals, the ambulance service, and health-epidemiological stations.

With all the importance attached to solving financial, material-technical, organizational, and procedural questions, the fate of the perestroika and of the improvement of public health protection will be in the hands of the personnel—in the hands of every individual of the more than 7-million-member army of medical workers.

In the past, we have put little thought into who should work in health care or whether an individual meets the professional and moral criteria for standing guard over the health and life of a person. We recall the words of A. P. Chekhov, who succinctly defined those criteria: "The doctor's profession is itself a heroic feat, and it requires selflessness, purity of soul, and purity of thought. Not everyone is capable of it. One must be clear-thinking, morally pure, and physically fit."

The extensive path of development and the left-over principal in relation to medicine have done great harm to the selection, training, and education of personnel. Correcting the present situation isn't easy, but if we don't correct it, we won't be able to solve our problems. Above all, we must raise the level of interest and responsibility on the part of our VUZes [higher educational institutions] and medical schools toward the selection of future physicians and other medical workers. We need greater participation, greater interest, and greater responsibility on the part of our health-care organs and labor collectives in that process, especially in the formation of specific groups of students. It's secret that the level of training in leading institutes of Moscow, Leningrad, Kiev, Minsk, Sverdlovsk, Novosibirsk, and a number of other cities is higher than in most of the rest of the country. As when Soviet health care was being set up, the leading VUZes must use targeted selection to train highly skilled health-care personnel for the rest of the regions of the country, too. That will represent yet another sign of the internationalism of our medicine. We are certain that the party committees of those cities will support that proposition.

We must revive the leading clinical schools that were always factories for highly skilled scientific and pedagogic personnel for all our republics. The revival of the doctorate system will serve that purpose. We need to do some serious thinking about training and educating our youth in medicine.

At present, the restructuring is under way in the system for training medical personnel. Underlying it is the elevation of the quality of training of physicians, with the priority in practical know-how and skills. We cannot tolerate the graduation of physicians with poor skills. Unfortunately, VUZes have been set up in the past in a number of places without the proper base or personnel,

because local leaders had notions of prestige and ambition or simply to fill the quota for the training of specialists. Expert assessment of the work done by VUZes is being introduced now, and practical assistance is being given to those that need it the most. However, questions associated with doctoring are so vital to every citizen of the country that there can be no liberalism in the assessment of the activity of a given VUZ or of the feasibility of its functioning.

New principles are also being incorporated into the process associated with the training of specialists, who will be tested before receiving the right to work in a narrow specialty and before receiving the appropriate diploma after two years of training. Much must be changed in the system associated with raising the skill levels of physicians, and the basis of that system must be the mastering of practical skills, and not endless lectures.

The system for certifying physicians—which long bore the nature of a questionnaire dealing with formalities and did not provide any incentive for improvement—is also being reexamined. The main thing is this: it must be based on the practical skills and know-how of the specialist and is done at the workplace of the individual being certified. The role of the labor collective in this process must also be strengthened. In general, we need to expand the rights of the labor collectives, increase their activity in management, in the evaluation of work and provision of material incentive for the workers, and in the improvement of the activity of institutions. That is an important factor in the democratization of health care and one of the most important prerequisites for its restructuring.

The restructuring in health care and the execution of the decisions of the party and the government for ensuring that by the year 2000 public health protection is on a level commensurate with the achievements of today's science is entirely realistic if the new thinking doesn't simply become the property of a narrow group of leaders and specialists, but penetrates broad circles of medical workers. The new thinking involves not merely a high level of professionalism, but also a sense of responsibility, civic duty, kindness, and charity.

It's distressing to read the complaints against the bribe-taking physicians who are indifferent to the suffering of people, and it's horrifying when we learn of the serious consequences of carelessness among medical workers or theft of food from sick children. Unfortunately, the rust of indifference that has afflicted our society in recent decades has encompassed a considerable segment of our medical workers. But if charity is not necessary for the physics profession or the engineering profession, without it there can be no such thing as a doctor. Rekindling kindness and charity is one of the most important tasks we're faced with. We hope that the newly created Soviet Fund for Charity and Health will help us in that regard. We don't see it so much as a source of additional

financing for health care, as we see it as a social organization that will prompt and help local health-care organs in handling questions associated with the protection of public health.

We hope that with everyone's efforts we will restore confidence in medicine and confidence in the physician. In that process, as in the process associated with the improvement of health care, our press has been called upon to play a big role. It has done a great deal to identify the sore spots of health care and its shortcomings. But that's not enough today. We need to have constructive conversation about the means of overcoming those shortcomings, we need to summarize the experience associated with the restructuring of health care, and we need to educate people in a spirit of kindness and charity. Our central newspapers—PRAVDA, IZVESTIYA, SOVETSKAYA ROSSIYA, MEDITSINSKAYA GAZETA—are traveling along that path. However, a great many incompetent, sensationalistic articles still come out in the press. Take, for example, the publication in KOMSOMOLSKAYA PRAVDA of an article on Soviet psychiatry. The editorial staff used as one of the authors a physician who had been brought to trial for rape, was judged to be not responsible for his actions, and was treated, and when he got out of the hospital, he attacked his own wife. The article didn't say one word about the immense restructuring that is going on in Soviet psychiatry or about the new approaches that are being taken in the organization of the service and treatment of patients—approaches that have already made it possible to remove nearly 500,000 people from the clinical rolls.

The cold wind of 1953, when the concept of the "killer physician" was put into circulation, blows from the opinions of SOTSIALISTICHESKAYA INDUSTRIYA correspondent Ye. Panov about an experiment that was being conducted in Leningrad. Panov announced this from the pages of the newspaper: "Consequently, it is advantageous for the hospital physician to release the patient a little earlier. But the most profitable variation is this—the rapid death of the patient. After all, they pay money on the basis of the average bed-day." Just what kind of restoration of confidence in the physician is that! Such opinions can only enkindle hatred.

Yes, we know of our shortcomings. We know that dishonest, criminally negligent people of no conscience are still among us. And we are struggling against them, and will continue to struggle against them fiercely. The Higher Certification Commission has been created, and the well-known scientists and physicians that are its members constitute a unique court of honor in health care.

UDC 614.2:312.6

#### Problems in Assessing the Activity of Health Care From Qualitative Indices

18402019C Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 2, 89 pp 27-31

[Article by A. Ya Nemenov, Tula Oblast Department of Health Care]

[Abstract] The transition to planning and evaluating the activity of health-care institutions on the basis of indices that reflect the state of public health requires the solution of certain organizational and procedural problems. The current system of statistics used for performing annual accounting in health care is unwieldy and contains virtually no information on demographic processes or quality of medical care. The author identifies the principal shortcomings of the system in use, citing among them the lack of coordination among various departments and services in terms of what indicators are evaluated, how and by whom; when the results are reported; and how the results are reported. Sector statistics are favored over regional statistical information.

UDC 613.63:575:669.1

#### Evaluation of Total Mutagenic Activity in Work Environment at Ferrous Metallurgy Plants

18402120A Kiev TSITOLOGIYA I GENETIKA in Russian Vol 23 No 2, Mar-Apr 89 (manuscript received 14 Oct 87) pp 16-20

[Article by K. S. Sedova, Institute of Complex Problems in Hygiene and Occupational Diseases, Novokuznetsk]

[Abstract] The aim of this work was to evaluate the total mutagenic activity of factors in the work environment at metallurgical plants and to analyze the genetic risk among workers. Four groups were examined cytogenetically for chromosomal aberrations: a control group consisting of workers outside the plant itself, workers involved in blast furnace operations, a group involved in steel smelting and its processing, and a group of workers performing steel rolling operations. The chromosome aberrations were 2-3 times higher in the blast furnace and steel smelting groups than in controls. The steel rolling group did not differ from the controls. Genetic-epidemiological studies concentrated on spontaneous abortions and children born with developmental defects. Four study groups were evaluated: (1) both parents employed outside the metallurgic plant; (2) fathers working in the plant, the mothers outside; (3) both parents working inside the plant; and (4) the fathers working outside the plant, and the mothers inside. The observed incidence of spontaneous abortions was respectively: 10.2%, 14.3%, 16.4% and 11.9%. No significant differences were observed between the study groups and the controls in terms of children with congenital defects. References 8: 6 Russian, 2 Western.

#### Women's Health: Primary Concern in Rural Health Care

18402136A Frunze ZDRAVOOKHRANENIYE KIRGIZII in Russian No 2, Mar-Apr 89 pp 3-5

[Article by N. Ye. Chernova, Kirghiz Scientific Research Institute of Obstetrics and Pediatrics]

[Abstract] One of the crucial factors in rural health service in Kirghizia deals with upgrading maternal

health services, particularly within the network of the feldsher-obstetrical stations. These stations currently cover 48.4% of the rural population and serve 54.8% of the pregnant women in the rural areas. However, the high birthrate and the lack of improvement in infant and maternal mortality statistics indicate quite clearly that the quality of care demands careful attention. The immediate need is for further material improvements in the stations themselves as far as construction, equipment and supplies are concerned and, more importantly, full staffing with qualified obstetricians and allied medical personnel. In addition, steps must be taken to enhance the clinical competence of existing staff and implement quality assurance procedures.

UDC 614.2:008

### **Improving the Structure of Health Care Management**

*18402098A Moscow SOVETSKAYA ZDRAVOOKHRANENIYE in Russian No 6 Jun 89 pp 25-31*

[Article by B. I. Boyarintsev, USSR Ministry of Health, Moscow]

[Text] A restructuring of the organizational structure of health-care management is required if a radical improvement is to be brought about in medical services for the public and if we are to accomplish the tasks set by the Basic Guidelines in the Development of Public Health Protection and the Restructuring of the USSR Health Care Sector in the 12th Five-Year Plan and for the Period up to the Year 2000.

The management apparatus for health care institutions comprises more than 400,000 persons (five percent of all persons working in that sector). Of the total number of persons working at health care institutions, supervisors account for 1.2%, accountants 1.3%, and statisticians 0.6%. The health care management organs employ approximately 27,000 persons. This represents an enormous potential of knowledge and skill that is not, however, always utilized effectively.

In the first place, a number of management organs of the health-care sector, of pharmacy and medical-equipment services, and of sanatoria have focused their efforts on economic problems by giving prime importance to the attainment of high gross output indices in their institutions' operations. In doing so, little concern was given to the direct management of public health or to meeting public needs for treatment-and-prevention services, drugs, and other forms of medical supplies.

In the second place, the structure that has come about suffered from a command-bureaucratic structure and excessive centralized management, which reduced the role and potential of regional health-care organs in resolving questions affecting public health protection in their regions. The health-care organs could not properly oppose departmental interests, which had an adverse

effect on labor safety, environmental protection, disease prevention, and the development of the network of health-care institutions and the provision of supplies to them. Operations in treatment-and-rehabilitation institutions of varying departmental subordination were poorly coordinated.

Work has begun on improving the organizational structure of health-care management on all levels. The following management structures have been slated for implementation:

- Two-tier structure: USSR Ministry of Health, the health ministry of a union republic—association, enterprise, organization, institution, teaching facility.
- Three-tier structure: USSR Ministry of Health, health ministry of a union republic—health ministry of an autonomous republic, main health-care administration (department) of a kray, oblast, district, city—association, enterprise, organization, institution, teaching facility.

A reduction in force of 30-50% has been slated for the republic health ministries and other health organs, and a 20% reduction is slated for the USSR Ministry of Health apparatus. In all (Table 1) there will be a reduction in force of over 12,000 employees in the management organs in the health sector. At the regional level, in 1988-1990, health-care departments of ispolkoms of the rayon soviets of people's deputies will be abolished in cities with populations under 800,000; beginning in 1991, such departments will be abolished in cities under 1 million inhabitants (with the exception of capitals of the union republics); 11 administrations and independent departments in the central apparatus of the USSR Ministry of Health will be abolished.

**Table 1. Reduction in Staff Positions in the Apparatus of Health Care Management Organs**

Management Organs	Number of Staff Positions (1987)	Subject to Reduction	Residual Number of Employees
Ministries of Health of USSR and Union Republics	2,718	815	1,903
Pharmacy Administrations of the USSR and Union Republics	935	376	559
Rayon (City) Health Departments	3,891	1,670	2,221
ASSR Health Ministries, Kray (Oblast) Health Departments	5,462	1,638	3,824

**Table 1. Reduction in Staff Positions in the Apparatus of Health Care Management Organs (Continued)**

Management Organs	Number of Staff Positions (1987)	Subject to Reduction	Residual Number of Employees
Medtekhnika Administrations	Approx. 1,120	Approx. 1,120	—
Kray, City, Oblast Pharmacy Administrations	Approx. 7,000	Approx. 7,000	—
Total: Absolute Number	21,126	12,619	8,507
%	100	59.8	40.2

The USSR Ministry of Health will coordinate the operations of the treatment-and-prevention institutions within the jurisdiction of other ministries and departments, in accordance with current law.

A Main Administration for the Organization of Medical Services is being created within the USSR Ministry of Health in order to improve health-care management and the operation of its organs and institutions; to develop new structures and types of treatment-and-prevention institutions; to coordinate the development of hospital, out-patient-polyclinic institutions, and emergency medical service institutions; to improve the forms of health services for employees of industrial enterprises and the agroindustrial complex; and to coordinate operations with the health services of ministries and departments and to derive medical statistics and furnish them to health ministry administrations and national economy management organs.

A fundamentally new approach will be implemented in the resolution of health-hygiene problems as well as in the undertaking of preventive measures to assure a healthy way of life for the population. These problems will be handled by the Main Health-and-Prevention Administration. It will concentrate its activities on guiding the work of the country's health-epidemiological services; on establishing priority health-and-prevention measures designed to prevent environmental pollution factors from harming public health; on increasing the effectiveness of the state health inspection; on ensuring adherence to state hygiene standards and health and antiepidemic regulations; on ensuring the close cooperation between treatment-and-prevention institutions and other ministries and departments in the organization of public hygiene education and publicity to encourage healthy lifestyles.

The priority directions of Soviet health-care system operations are the prevention and reduction of morbidity among women and children; the organization of medical services for working women; the reduction of child and maternal mortality; family planning work; the reduction of artificial interruptions of pregnancy; the development of specialized medical and sanatorium care and a restorative treatment and rehabilitation system for

women and children; and medical services in preschool institutions, schools, and boarding schools of various types. The resolution of these problems has been entrusted to the Main Administration for the Protection of Maternal and Pediatric Health.

A Main Economics Administration has been created within the USSR Ministry of Health. Its functions include the improvement of the economic planning mechanism, of economic methods of administration in the health-care sector, of forms of incentives to raise the quality of treatment-and-prevention measures and the organization, standardization, and remuneration of health-sector employees; and the planning, financing, and improvement of the forms and methods of accounting, recordkeeping, and financial-management operations of subordinate organizations, as well as the implementation of supervisory and inspection activities.

The following are the basic functions of the Main Administration for Science and Medical Technology: coordination and organization of planning; implementation of measures for the intensification and monitoring of the effectiveness of scientific-research projects undertaken for practical health-care purposes; the organization and improvement of the system for the selection, expert evaluation, and implementation of scientific research results, medical technologies, and innovations into the practical health-care sector; the participation in the establishment and coordination of international scientific relations; and the development of scientific information retrieval for the health sector.

The Main Administration for Capital Construction and Plant Equipment is carrying out a unified engineering policy in the planning, design, and construction of health-care facilities. It is working out specifications and standards documentation and is monitoring the design and construction of health-care facilities, the planning and financing of facilities under national jurisdiction, the expert evaluation of planning-and-cost-estimate documentation, centralized material and technical support, and the outfitting of pilot installations with the appropriate complements of equipment. The administration is providing transportation for organizations, institutions, and enterprises under construction or currently operating and is organizing their use.

The USSR Ministry of Health has the following within its central apparatus:

- A Main Engineering Administration, which implements a unified engineering policy in the development of new medical equipment and instruments. It forwards orders to industrial sectors and finance projects to create and implement the industrial production of medical equipment. It tests and registers domestic and foreign equipment; implements standardization and assumes metrological control of medical equipment and computer equipment used in information-retrieval and diagnostic systems;

## PUBLIC HEALTH

JPRS-ULS-90-010  
2 July 1990

plans the production of medical equipment at enterprises of the USSR Ministry of Health, the retooling of those enterprises, and the creation of new production capacities (within the health-care system), including joint ventures with foreign companies.

- A Main Epidemiological Administration, which organizes preventive and antiepidemic measures designed to maintain a favorable epidemic picture in the country (including that for AIDS), ensures the protection of the country against the contamination and spread of infectious diseases, and brings about the localization and elimination of the foci of such diseases if they occur.

A number of associations are being created within the USSR Ministry of Health:

- The All-Union "Soyuzfarmatsiya" Association (Moscow), which is called upon to perform a fundamental restructuring of pharmacy services in the light of the new management conditions and to ensure that the need for drugs and medical articles is satisfied. It is also called upon to develop and introduce more rapidly new, highly effective means and forms of drug services for the public and to implement achievements in pharmaceutical science.
- The All-Union Association for the Manufacture, Installation, Adjustment, and Sale of Medical Equipment "Soyuzmedtekhnika" (Moscow), which consists of the "Soyuzmedkomplektopostavka" administration, the special administration of "Soyuzmedmontazhnaladka," and the center for technical training, joint ventures, and service organizations (including the participation of firms from capitalist and socialist countries).
- The foreign trade association "SoyuzzdravekSPORT."
- The geological survey association "Lechminresursy" (based at the "Geominvod" administration).
- The scientific-production association "Soyuzmedinform," which consists of the All-Union Scientific-Research Institute of Medical and Medical Technical Information, the State Central Scientific Medical Library, and a printing combine.

The All-Union Scientific-Practical Association "Soyuztransplantat" is being organized within the Scientific-Research Institute of Transplantology and Artificial Organs and the regional transplant centers with the rights of association branches. Seventeen centers are planned for construction in 1995.

Also organized within the USSR Ministry of Health are the following:

- The All-Union Scientific-Production Association "Ekran," consisting of the All-Union Scientific-Research and Medical Equipment Testing Institute (VNIIMT), a pilot-experimental plant, a specialized data processing and hardware enterprise with a

branch in Obninsk, the Gorkiy Production Enterprise for Polymer Medical Articles, and a joint Soviet-Bulgarian laboratory for pulmonary instrument-making (Soviet branch).

- The All-Union Scientific-Production Association "Stomatologiya," consisting of the Central Scientific-Research Institute of Stomatology, the Odessa Scientific-Research Institute of Stomatology, the department for the advanced training of stomatologists (Moscow), two consultative stomatology polyclinics (Moscow), two cost-accounting stomatology polyclinics (Moscow), a medical plastics and stomatological materials plant (Kharkov), an experimental-engineering laboratory for stomatological materials (Kharkov), and 12 branches of the All-Union Scientific-Production Association for Regional Public Services.

Substantial changes have been made in the list of organizations directly subordinate to the USSR Ministry of Health (Table 2).

**Table 2. Changes in Number of Organizations Subordinate to the USSR Ministry of Health**

Organization	Number in 1987	Projected Number after Reorganization
All-Union production, scientific-production, and scientific-practical associations	3	6
Science centers	2	7
Scientific-research institutes	48	43
Medical academies	8	3
Medical institutes	10	2
Institutes for the advanced training of physicians	16	16
Procedural Offices	4	2
Cost-accounting enterprises	89	50
Central apparatus subdivisions	25	16

A number of new large medical science centers has been organized: the All-Union Hematology Science Center, the All-Union Scientific-Research Center for Protection of Maternal and Pediatric Health, the All-Union Scientific-Research Center of Preventive Medicine, the All-Union Science Center for Biomedical Problems in Study of Drug Abuse, and the All-Union Science Center for Medical Rehabilitation and Physical Therapy, as well as the planning and implementation labor organization center "Soyuzzdravorgtrud."

In order to intensify the integration of medical science and practical health care, plans are being made to

consolidate scientific-research organizations and treatment-and-prevention institutions within scientific-production and scientific-practical associations so that no less than 30 percent of the persons engaged in sector science will be concentrated within these associations.

The creation of diagnostic and specialized science centers and regional medical associations is slated to supplement the currently operating institutions, in order to strengthen the basic structural link of the health-care sector.

The formation of regional medical associations financed on the basis of their final work results from the state budget, the cost-accounting income of enterprises, monies from the public for medical services, and other sources is being currently tested on an experimental basis in Leningrad and the Kemerovo and Kuybyshev oblasts.

Managerial independence and economic responsibility of the associations underlie the economic mechanism now being worked out on an experimental basis. The experiment is slated to be carried out within the plans and budgeted annual allocations established for these territories. The operations of the associations will be planned in accordance with the size of the population for which the association is responsible.

The primary criteria for evaluating the operation of the health sector associations (institutions) and the material incentive of their labor collectives are the indices that reflect the quality of treatment-and-prevention services, positive health-epidemiology conditions, and the reduction of levels of morbidity associated with temporary disability, levels of disability, and levels of mortality. Economic levers and incentives will be experimentally developed in order to improve disease prevention, raise the quality of medical services, and strengthen the health of the population.

The relationships between the structural subdivisions that make up the regional medical associations are built on the basis of mutual material and financial responsibility for the timely and high-quality fulfillment of their obligations. The manner in which the economic relations are implemented (tariffs, sanctions) is determined by the statute on the new economic conditions.

One should note in conclusion that the priority directions for improving health-care management include the following: the development and implementation of long-term target and multi-purpose sociomedical programs and the "Health" intersector and interregional programs that are designed for the accelerated sociomedical development of the country; the organization of measures to develop the preventive area of public health care and to improve the quality of public medical services and the provision of drugs; the concentration of financial, material, and personnel resources in the priority directions of health-care development; the adoption in the sector of a unified progressive scientific-technical policy that will provide for the resolution of major problems in the prevention, diagnosis, and treatment of diseases in

accordance with social demand and the transfer of achievements in science and technology and advanced-level experience to a broad range of medical practice; the broad development of international cooperation, primarily with the CEMA member-nations, in the health-care sector and medical science; an improvement of the forms and methods of health-care organization and administration, of the economic mechanism, of planning, and of the system of material and moral incentives; the conduct of an active personnel policy, the organization of an effective system for raising personnel skills, the training and retraining of personnel, and a strengthening of the material and technical base of the health-care sector.

COPYRIGHT: "Sovetskoye zdravookhraneniye", 1989

UDC 364.444:[364.65-053.3+364.65-055.26(474.5)

### **Health Status of Pregnant Women and Children Under One Year of Age in the LiSSR**

*18402183b Moscow SOVETSKAYA*

*ZDRAVOOKHRANENIYE in Russian No 6 Jun 89*  
*pp 31-38*

[Article by R. K. Ignatyeva and O. S. Rachkauskene, All-Union Scientific-Research Institute of Social Hygiene, Economics, and Health Administration im. N. A. Semashko, USSR Ministry of Health, Moscow; LiSSR Ministry of Health, Vilnyus]

[Text] The creation of reliable systems for deriving information about the health and development of children and the factors behind their status in the context of the birth rate and child mortality rate in the various regions of the country is of exceptional importance today in the validation and development of regional programs for protecting the health of mother and child and for reducing the perinatal, infant, and child mortality rate. Such systems are also vital to the subsequent evaluation of the programs' effectiveness.

In that connection, in three territories of the country that represent areas with a low infant mortality rate (city of Panavezhis and the Panavezhskiy Rayon of the LiSSR), an average rate (city of Lipetsk, RSFSR), and a high rate (city of Fergan, Uzbek SSR), the USSR Ministry of Health introduced in 1985 the "System for Tracking the Health of Pregnant Women, Newborn Infants, and Children," which was developed by the Department for the Study of Child Health at the All-Union Scientific-Research Institute im. N. A. Semashko and had been tested on an experimental basis during the 1978-1984 period in the Lipets Oblast.

The system is designed to obtain a basic volume of data from experimental medical documentation for child and maternity institutions and functions on an ongoing basis as a collector of information about the health and development of children (based on a broad selection of indicators) and about the varied factors of the environment in which a child resides. The target of the tracking system is the cohort of children and infants born after a

pregnancy period of 20 or more weeks within the year 1986 (i.e., a defined generation) and their mothers within the indicated period of pregnancy and birth.

Observation of the selected cohort in the special program was begun from the time a physician establishes a woman's pregnancy during her first visit to a prenatal clinic. The observation is continued throughout the entire pregnancy and at the time of its termination (birth or late miscarriage within the 1986 base year for the formation of the cohort); observation of live births was established from the time of birth and done prospectively.

The present report offers an analysis of certain results obtained in the course of the aforementioned tracking system's operation in Panavezhis and the Panevezhskiy Rayon of the LiSSR.

The LiSSR, as is the case with the other Baltic republics, has the lowest mortality rate among the republics of the USSR for children under the age of one year (14.4 per 1,000 births in 1985, and 11.6 per 1,000 in 1986).<sup>1</sup> More than one-half (54.2%) of all deaths among children under the age of one year occurred here during the neonatal period (0 to 27 days of life) and are of endogenous origin (perinatal causes and congenital anomalies); 40.8% perish during the first week of life. The neonatal mortality rate in the LiSSR in 1985 was 7.7 per 1,000 births, and the postnatal mortality rate, 6.5 per 1,000.

An analysis of the infant mortality dynamics in the LiSSR for the last 10 years indicates the existence of two clearly pronounced tendencies. The first is a dynamically progressive, steady reduction in postneonatal mortality (by a factor of 1.7) as a whole and in each of its components (including deaths from respiratory organ diseases, infectious diseases, home-birth deaths, and infant deaths after less than one day of life). The present child mortality rate in the postneonatal period (28 to 365 days) is also due (1/3 of the cases) to causes originating in the perinatal period. The second trend is a very small reduction in the newborn mortality rate against the background of a high morbidity rate among both full-term and premature infants. There was also only a slight decrease in stillbirths, which results in a slow reduction in the perinatal mortality as a whole.

It is the prevention and treatment of fetal and newborn pathological conditions that occur in the perinatal period that must become the principal area of development of the preventive program in the LiSSR and the entire Baltic region.

The peculiarities of the course of the perinatal period determine not only the level of infant mortality, but also, to a considerable extent, the health of surviving children. According to the data of a special prospective cohort study carried out in Panavezhis and the Panavezhskiy Rayon of the republic during 1985-1987 by the All-Union Scientific-Research Institute im. N. A. Semashko in concert with the LiSSR Ministry of Health, only 67.5% of the newborn infants were healthy, and 10.4% had congenital or acquired perinatal pathology. The

remaining newborns (22.1%) belonged to a high-risk group that would subsequently develop health problems.

We found that the overall index of newborn morbidity in the perinatal period was 485.3 per 1,000 births and that 1/3 of the cases represented by that figure (156.9 per 1,000) were due to situations associated with a "large fetus" diagnosis (weight over 4,000 grams), and only 5.9% (28.8 per 1,000) was attributed to premature births, with 6.4% (31.0 per 1,000) due to intrauterine fetal hypotrophy (Table 1).

Congenital anomalies accounted for 10.9% of all pathology identified in the perinatal period (52.9 per 1,000); the latter figure was primarily due to the early identification of hip joint dysplasia (40.3 per 1,000 births).

**Table 1. Level and Structure of Newborn Morbidity in the Perinatal Period (Panavezhis, 1986)**

Diagnosis	Figure per 1,000 births	Structure, % of morbidity cases
Birth trauma	36.2	7.5
Comprising:		
Intracranial	1.4	0.3
Other forms of trauma	34.8	7.2
including:		
collar bone fracture	17.6	3.6
paresis	2.3	0.5
cephalhematoma	14.9	3.1
Intrauterine fetal hypoxia	32.5	6.7
Asphyxia of newborn	28.8	5.9
Other respiratory disorders	5.6	1.2
Infections specific to the perinatal period	1.9	0.4
Hemolytic disease	1.4	0.3
Congenital anomalies	52.9	10.9
Comprising:		
Hip joint dysplasia	40.3	8.3
Others	12.6	2.6
Intrauterine fetal hypotrophy	31.0	6.4
Premature births	28.0	5.9
Functional immaturity	33.0	6.8
Prolonged gestation	1.9	0.4
Large fetus	156.9	33.0
Hematological disorders	47.7	9.8
Diseased acquired in the first week of life	3.2	0.7
Others	23.5	4.1
Average	485.3	100.0

The birth trauma level is relatively low (36.2 per 1,000 or 7.5% of total morbidity), and those traumas are primarily represented by cephalhematomas (14.9 per 1,000)

and collar bone fractures and pareses (19.9 per 1,000); intracranial brain trauma was encountered rarely (in 0.3% of the cases, or 1.4 per 1,000 births).

Relatively frequently observed in the perinatal period were various types of respiratory disorders in the fetus and newborn (66.9 per 1,000, or 13.8% in the morbidity structure) and are primarily represented by intrauterine fetal hypoxia (32.5 per 1,000) and asphyxia of the newborn (28.8 per 1,000).

The structure underlying the causes of perinatal mortality in Panavezhis presents a different picture: intrauterine asphyxia accounts for 45.0% of all child (or fetal) deaths during this period. Pneumopathy accounts for 15.0%, hemorrhagic diseases (pulmonary form) accounts for 20.0%, and congenital defects (primarily CNS) and chromosomal diseases accounted for 20.0%.

In the overwhelming majority of cases child morbidity and mortality were due to adverse effects on the fetus stemming from the mother's body: various types of extragenital and genital pathology affecting the woman as well as complications in pregnancy and in childbirth.

Only 26.9% of the women who gave birth in Panavezhis in 1986 could be classified as healthy persons. Against a background of extragenital pathology 56.9% of those women developed some kind of pregnancy-related or childbirth complication. Moreover, 8.3% of the pregnant women exhibited a combination of three types of pathology (the highest medical risk group); 16.2% suffered from chronic somatic diseases uncomplicated by a pathology specific to the pregnancy or parturition period.

The total level of female morbidity during the pregnancy, childbirth, and early postnatal period was 1,980.3 per 1,000 women (Table 2), in which case complications directly associated with pregnancy (nephropathy, 84.1 per 1,000 and threatened abortion, 100.3 per 1,000) accounted for only 15.8% (i.e., 280.3 per 1,000).

Complications arising during labor and delivery accounted for 38.0% (or 753.7 per 1,000) of the total index (238.4 per 1,000 for premature rupture of the fluid sac, 153.3 per 1,000 for parturition anomalies, fetopelvic disproportion—108.8 per 1,000, pelvic anomalies—96.0 per 1,000, placental anomalies—49.5 per 1,000, umbilical cord anomalies—38.6 per 1,000, abnormal fetal position, primarily in pelvic presentation—37.6 per 1,000).

However, the greatest proportion of pathology (46.0%, or 941.4 per 1,000) was represented by pregnancy-related and birth complications due to extragenital diseases, primarily those of the urogenital tract (291.8 per 1,000), including pyelonephritis (73.2 per 1,000) and vaginitis, mainly trichomoniasis (163.2 per 1,000), arterial hypertension (106.8 per 1,000), respiratory organ diseases (98.9 per 1,000), and infectious diseases (16.8 per 1,000). One out of every ten pregnant women (108.0 per 1,000) was found to be obese.

**Table 2. Morbidity (per 1,000 observed persons) in Women (identified for the first time) During Pregnancy, Parturition, and the Early Postnatal Period (Panavezhis, 1986)**

Diseases	Period of Pregnancy	Births	Early Postnatal Period	Morbidity per 1,000 Postpartum Women
<b>Complications Primarily Associated with Pregnancy</b>				
Vomiting	8.9	-	-	8.9
Edema	62.3	-	-	62.3
Nephropathy and eclampsia	83.1	-	1.0	84.1
Threatened abortion	100.3	-	-	100.3
Hydramnion	8.9	-	-	8.9
Isthmic-cervical insufficiency	13.8	-	-	13.8
Others	2.0	-	-	2.0
Total	279.3	-	1.0	280.3
<b>Complications Arising During Labor and Delivery</b>				
Abnormal fetal presentation	-	37.6	-	37.6
Pelvic anomaly	95.0	1.0	-	96.0
Fetopelvic disproportion	-	108.8	-	108.8
<b>Including:</b>				
Large fetus	-	104.8	-	104.8
Anomalous parturition	-	153.3	-	153.3
Premature rupture of sac	-	238.4	-	238.4
Placental complications	-	39.6	9.9	49.5
Umbilical cord pathological complications	-	38.6	-	38.6
Obstetric trauma	-	6.9	-	6.9
Hemorrhages	-	7.9	2.9	10.8
Others	-	12.8	1.0	13.8
Total	95.0	644.9	13.8	753.7
<b>Diseases Complicating Pregnancy, Births, and the Postpartum Period</b>				
Arterial hypertension	106.8	-	-	106.8
Chronic rheumatic heart diseases	6.9	-	-	6.9
Anemia	93.0	-	18.8	111.8
Infectious diseases	16.8	-	-	16.8
Genitourinary tract diseases	289.8	2.0	-	291.8
<b>Including:</b>				
Pyelonephritis	72.2	1.0	-	73.2
Vaginitis	163.2	-	-	163.2

**Table 2. Morbidity (per 1,000 observed persons) in Women (identified for the first time) During Pregnancy, Parturition, and the Early Postnatal Period (Panavezhis, 1986) (Continued)**

Diseases	Period of Pregnancy	Births	Early Post-natal Period	Morbidity per 1,000 Post-partum Women
Influenza and otorhinological diseases	18.8	1.0	2.0	21.8
Other respiratory organ diseases	74.2	-	2.9	77.1
Thyrotoxicosis	17.8	-	-	17.8
Obesity	108.8	-	-	108.8
Lower-extremity varicose veins	28.7	-	-	28.7
Myopia	35.5	-	-	35.6
Others	111.7	1.9	3.9	117.5
Total	908.8	4.9	27.6	941.4
Postpartum complications	-	-	4.9	4.9
Grand total	1,283.1	649.8	47.3	1,980.3

The high level of pathology that complicated pregnancies and births stemmed from the peculiarities of the present-day contingent of child-bearing women. More than half of that contingent (55.0%) was made up of first-time child bearing mothers who exhibited a characteristic high level of birth complications. The first-time mothers included a rather high percentage of young mothers (6.7) who frequently bear children out of wedlock or who registered to get married because of pregnancy (37.1% of the 16- to 19-year-old girls, and 26.7% of women aged 20 to 24). This frequently resulted in sociopsychological stress which had an adverse effect on the pregnancy and parturition. Those pregnant for the first time comprised 88.2% of the first-time mothers; whereas in the remaining women of this group (11.8%), some 3.4% had had one artificial abortion and 0.4% had had more than one abortion, and 7.1% had had one spontaneous abortion and 0.9% had had more than one abortion.

The obstetric case histories were particularly unfavorable for first-time mothers 30 or older, who comprised 9.4% of all first-time mothers, 25% of whom had previous pregnancies that were artificially aborted or, more often, aborted spontaneously.

Among the women who had given birth before—who comprised 45.0% of the entire child-bearing contingent—the greatest percentage (35.2%) comprised those who were giving birth for the second time. A total of 7.4% of the child-bearing women were giving birth for the third time, whereas mothers who were giving birth for at least the fourth time were relatively rare (2.4%). Moreover, the medical histories of the women who have given birth before included artificial or spontaneous

abortions. One should note that in 25.5% of the cases, the interval between the latest abortion and the present childbirth was less than 12 months.

On the whole, the previous pregnancy in multigravidae had resulted in normal births in only 63.5% of the cases, in artificial abortions in 20.7% of the cases, in spontaneous abortions in 11.7%, in premature births in 3.1%, and in ectopic pregnancies in 1.6% of the cases.

The noted characteristics of the child-bearing contingent of women (the high level of chronic extragenital and genital pathology, the high proportion of unfavorable obstetric case histories) strongly requires recovery prior to pregnancy. However, our survey demonstrated that only 12% of these women were examined and treated prior to pregnancy, and that primarily for infertility or a history of spontaneous abortions. Little use is made of pregnancy interruptions because of medical indications either in the early stages or the late stages of pregnancy (in the presence of serious fetal congenital pathology). This is due to the insufficient development of genetic services and the poor introduction of intrauterine diagnosis of fetal injuries in the practice of maternity homes in Panavezhis and the Panevezhskiy Rayon.

The overwhelming majority (95.9%) of women of reproductive age who gave birth in 1986 were employed in social production, and only 2.2% were housewives. A total of 1.9% were students, 54.8% were workers, and 41.1% were white-collar workers. In the opinion of the physicians, 44.2% of the workers and 10.1% of the white-collar employees were working under conditions that adversely affected pregnancy and childbirth.

Despite the comparatively high cultural and educational level of the pregnant women (84.2% completed a secondary and secondary-specialized education, and 14.2% completed a higher education), only 85.4% registered for prenatal clinic services in the early pregnancy period (before the 12th week of pregnancy), and 14% registered between the 13th and 27th weeks, and 0.6% registered later than the 28th week (all of this group was out of wedlock). The overwhelming majority of the pregnant women visited an obstetrician-gynecologist 11 to 15 times (58.0%), while 29.3% made more than 16 visits, and 12.7% made fewer than 10 visits. Out of the total number of observed women 88.9% of the pregnant women visited other maternity specialists more than four times (internists, stomatologists), and only 0.2% of the women who registered late had not been examined by specialists.

On the whole, the services rendered by women's clinics for prenatal fetal care was rather effective, inasmuch as complications directly associated with pregnancy were relatively rare against a background of a high level of extragenital pathology. More frequently observed were childbirth complications in which a considerable proportion was due to fetopelvic disproportion as well to unfavorable obstetric case history. It is essential to give

more thorough consideration to the tactics of compassionate delivery that takes into account the peculiarities of the present-day contingent of women.

The continuity in the observation of mother and child by all components of the maternity and child care system is rather well set up. When a child is discharged from a maternity home for observation at a pediatric polyclinic, the health category of the newborn infant is immediately reported. Practically all of the newborn infants in a risk group and the 3rd health category are visited at their homes by a pediatrician one day after their discharge.

As was mentioned previously, child mortality in the postneonatal period in the Baltic republics is at the lowest level in the country (in 1985, in the LiSSR it was 5.5 per 1,000 in the cities and 8.7 per 1,000 in the rural areas). However, it is considerably higher than in the economically developed countries of Europe. Constituting a basic target for reducing postneonatal mortality are diseases of the respiratory organs, which accounted for 20.8% of all child deaths in the cities of the LiSSR and 39.8% of rural child deaths during this period. A total of 49.8% of the urban postneonatal deaths and 23.2% of the rural deaths were due to severe congenital developmental defects. The practical reduction in the mortality rate for those types is only possible by the application of advanced intrauterine diagnosis of fetal injuries followed by pregnancy interruption. The treatment of severe congenital defects at the contemporary state of the art does not yield stable results and only leads to a larger community of invalids from childhood.

Morbidity among children in the first year of life is also dominated by diseases of the respiratory organs, which account for 45.9% (or 1,803.8 per 1,000 children) of all pathology. Second place (13.1%) is held by diseases of the endocrine system, feeding disorders, and metabolism disorders (514.5 per 1,000), with rickets (430.0 per 1,000) accounting for 83.4% of the diseases of this category and dystrophy accounting for 8.9% (46.0 per 1,000). Third place (11.0%) belongs to various conditions arising in the perinatal period (432.4 per 1,000), and in fourth place are diseases of the digestive system organs (168.1 per 1,000). In fifth place (3.9%) are diseases of the skin and subcutaneous cellular tissue (153.1 per 1,000), 90% of which is represented by exudative diathesis. In sixth place (3.6%) are infectious and parasitic diseases (47.9 per 1,000), and in seventh place (3.5%) are traumas and poisonings (139.9 per 1,000). Congenital anomalies are in eighth place (3.3%) in the morbidity picture (131.7 per 1,000).

The total child morbidity index in the first year of life in Panevezhis was 3,932.9 per 1,000 children of the observed cohort, which is 13.8% lower than in Lipetsk (4,465.0 per 1,000), primarily because of the lower prevalence of diseases of the respiratory organs and the digestive system, and particularly because of the low level of perinatal diseases in Panevezhis.

The health index, i.e., the percentage of infants who did not become ill in the first year of life, was 7.1. As a whole, 28.4% of all the children were classified as practically healthy by the end of the first year of life. By that time the proportion in the population of children with congenital and acquired chronic pathology decreased to 4.8% due to deaths of children with the most severe injuries, but the proportion of risk-group children increased because that group included children with rickets, exudative diathesis, and frequent otorhinolaryngological diseases. The primary efforts of the pediatric services should be directed towards the prevention of these types of pathology.

It is generally recognized at the present time that breast feeding is an important factor in maintaining a child's health in the first year of life and in his complete physical and psycho-emotional development. Our domestic school of pediatricians has consistently championed the indisputable advantages of breast feeding even during that period (the 40's to 70's) when the substitution of breast feeding by various types of formulas was considered harmless in the economically advanced foreign countries (especially in the USA). Those views have now been reexamined throughout the world.

However, as one can judge from the data of our study in Panevezhis, the tradition of breast feeding in the first year of life was very feeble in the Baltic region. As early as the third month, almost one-half of the children (43.1%) were being fed completely by bottle. By the sixth month, ¾ of the children (74.5%) were being bottle fed, and by nine months only 2.8% of the mothers were breast-feeding their children. By the twelfth month that figure was only 0.2%.

At the same time, a similar study conducted by the All-Union Scientific-Research Institute imeni N. A. Semashko in Lipetsk and Fergana of the Uzbek SSR showed that this problem was less acute in other regions. Thus, in Lipetsk 86.8% of the mothers were continuing to breast-feed their babies by the third month. One-half of the mothers were breast-feeding (50.1%) by the sixth month, one-third (36.7%) by the ninth month, and one-fourth (24.9%) by the twelfth month. As regards Fergana, the overwhelming proportion of mothers (72.6%) were breast-feeding their babies until the end of the first year, with practically all women of indigenous nationality and Tartars (92.8%) breast-feeding at that point.

Indeed, the high level of paratropy (46.0 per 1,000) and, to some extent, rickets (430.1 per 1,000) in Panevezhis can be attributed to the nature of infant feeding as well as the significant proportion of children who were overweight. In Lipetsk the level of this pathology was significantly lower (8.9 and 32.7 per 1,000 respectively), although the latter might be connected to an underestimation of rickets cases.

Based on the foregoing analysis, the priority directions in working out a program to strengthen maternal and child

health and to reduce child mortality in the Baltic region should take the following points into account:

- Prenatal fetal care, including the protection of the health of the girl or women prior to pregnancy: improve the forms of methods of general health screening of women of fertile age, of teenage girls, pregnant women, and breast-feeding mothers. They should be given social and legal assistance.
- Development of public medical-genetic services for the purpose of preventing congenital and inherited pathology.
- The broad application of state-of-the-art prenatal diagnosis of fetal pathology for the purpose of the timely correction and prevention of births of children with severe congenital pathology.
- Improvement in the maintenance of pregnancy and the conduct of childbirth in the event of maternal pathology, and better therapeutic care for premature and ill newborn infants.
- Optimization of women's reproductive behavior by propagating the practice of family planning, publicity about and availability of modern contraceptive methods for the purpose of preventing abortions, and increasing the intergenetic intervals, particularly when there was an unfavorable outcome in a previous pregnancy.
- Further improvement in the work done with mothers and families of high social risk (single mothers, juveniles, users of alcohol and narcotics, etc.) and the provision of medical social assistance to such persons; so that mothers of these groups reject their own children less frequently, it would be advisable to organize joint residential boarding homes for single mothers and their infants who need social assistance, until the child reaches 1.5-2 years. This will help to create conditions for the social adaptation of the single mother in society.
- Provision of a balanced diet for the public for the purpose of preventing avitaminosis, anemias, and particularly obesity in mothers and children. Greater publicity should also be given to breast feeding.
- Stricter control over the enforcement of laws governing industrial safety for women: priority resolution of problems concerned with the improvement of women's working conditions, an improvement in the legal standards governing women working in industry and agriculture.

The development and realization of the Comprehensive Program for Protecting the Health of Mother and Child and for Lowering Child Mortality in the Baltic Republics and the BSSR for the Period 1985-1995, which has now been developed by the USSR Ministry of Health in conjunction with the ministries of the union republics, is of considerable social importance because, to a certain

extent, this region can serve as a model for a better approach to the protection of mother and child in our country.

#### Footnotes

1. "Narodnoye khozyaystvo SSSR za 70 let. Yubileynyy statisticheskiy sbornik" [National Economy of the USSR for the Last 70 Years. Anniversary Statistical Collection]. Moscow: Finansy i statistika, 1987, p 409.

COPYRIGHT: "Sovetskoye zdравоохранение", 1989  
618.333+616-053.31-036.88](470.23-25)

#### Structure of Perinatal and Late Neonatal Mortality in Rural Areas

*18402016 Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 1, 89 (manuscript received 27 Feb 87) pp 24-26*

[Article by R. I. Shmurun and V. B. Matskevich, Volkov Interrayon Center of Pathologic Anatomy Service of Northeastern Leningrad Oblast]

[Text] In studying perinatal mortality, an important role is played by the use of the data of pathologic anatomy research. At present, the percentage of stillbirths amounts to 62.9-69.6%.<sup>1,2</sup> At the same time, that group of causes of death is rarely analyzed separately, although it should evoke some degree of interest. The causes of death of among infants in the late neonatal period are analyzed just as rarely, even though a considerable percentage of children die in that period from diseases of the perinatal period. A great deal of interest should also be evoked by infectious pathology, which accounts for 7.3-11% of the structure of that figure. But even in recent works,<sup>2</sup> the authors do not analyze or discuss that structure in detail, because of doubts about what the cause of death is—infestation of the fetus, or infection of the mother. Unfortunately, the authors similarly do not refer to the presence of spinal injury at birth, the incidence of which has increased markedly and has prompted pathologic anatomists to begin studying the spinal cord more frequently.

The material for this study was based on 567 infants—fetuses and newborns 28 days of age or under—born in rural maternity hospitals and departments in four rayons in the northeastern portion of Leningrad Oblast: 239 were stillborn, 258 were six days of age or under, and 70 were 7-27 days of age. Among the infants, 175 were stillborn full-term, 64 were stillborn premature, 139 were full-term newborns six days of age or under, 119 were premature newborns six days of age or under, 36 were full-term newborns 7-27 days of age, and 34 were premature newborns 7-27 days of age. The premature infants accounted for 4.45% of the total number of infants born.

The analysis was done on the initial cause of death, which, according to the international classification of diseases,

injuries, and causes of death of the ninth inspection, is equivalent to the basic disease, is a nosological unit, and, as a rule, ranks first in diagnostics. Strict adherence to that rule over the years has made it possible to perform reliable retrospective analysis and to compare the materials. Supplementing the rubrics "main disease," "complication of main disease," and "accompanying diseases" in the posting of pathologic anatomy diagnoses are rubrics such as "pregnancy pathology," "birth pathology," and (in recent years) "afterbirth pathology."<sup>5</sup>

That structure for the pathologic anatomy diagnosis corresponds to the structure that is generally accepted, reflects completely the cause-effect relationships between mother and fetus (or child), and focuses attention on the pathology of the dead infant.<sup>6</sup>

The material here represents six leading groups and an "other" group: intrauterine asphyxiation (IUA), intrauterine infection (IUI), birth injury (BI), newborn pneumopathy (NPP), hemolytic disease of newborn (HDN), and developmental defects (DD). The "other" group consists of infections of, for example, the gastrointestinal tract or the respiratory system.

The IUA group involved acute asphyxia arising as a result of disorders of uteroplacental or placental-fetus blood circulation, while IUI pertained to infection-related injuries of the fetus such as transplacental infection and ascending and descending intraamniotic infections (all bacterial or viral: influenza, parainfluenza, respiratory-synctial infection, adenoviral infection, herpes, cytomegaloviral infection, and Mycoplasma infection). Diagnosis of viral infections is done with fluorescing antibodies or histologically. It has been established that here we are dealing with mixed infections, such as virus-virus, virus-virus-bacteria, virus-bacteria, and virus-Mycoplasma. The NPP group consisted of so-called primary hyaline membranes, hemorrhagic inflammation syndrome, primary atelectasis, and hemorrhage without the other diseases or the conditions provoking them. The HDN group consisted of RH factor or ABO blood group hemolytic disease.

It should be noted that in the perinatal group, the ratio of dead males to females was 137:100 (among the full-term infants, it was 149:100; among the premature infants, 118:100); in the late neonatal period, the ratio was 106:100 (full-term infants, 125:100; premature, 89:100).

In the perinatal group, stillborns made up 48.1%; newborns made up 51.9%. Among the stillborns, the ratio of male to female was 109:100 (Table 1). The most frequent cause of death among stillborns was IUA; among newborns, the most frequent causes were NPP, IUI, and BI. Males predominated both among the stillborns and

among the newborns who died (168:100). Of the 70 cases of late neonatal death, 52.9% of the cases were due to typical perinatal pathology.

**Table 1. Structure of Perinatal and Late Neonatal Mortality Among Children, Differentiated by Sex (in percent)**

Cause of death	Stillborn		Age of infant			
			Six days or under		7-27 days	
	M	F	M	F	M	F
IUA	74.4	72.8	14.2	16.7	2.8	8.8
IUI	8.8	7.0	21.6	17.7	16.7	14.8
BI	4.0	6.2	22.8	15.6	16.7	5.9
NPP	—	—	20.4	22.9	2.8	—
HDN	4.8	3.5	2.6	8.3	—	2.9
DD	6.4	7.9	16.0	14.6	16.7	17.6
Other	1.6	2.6	2.4	4.2	44.3	50.0

Analysis of the material for gestational age at birth shows that among the full-term infants, who represented 63.2% of the perinatal deaths, cases of stillbirth predominated in 55.7% (male/female ratio, 124:100). The most frequent cause of death among the stillborns was IUA; among the newborns, BI and DD were the most frequent causes, with IUI and IUA encountered less often. Among those who die in the late neonatal period, 58.3% die of diseases of the perinatal period (Table 2).

**Table 2. Structure of Perinatal and Late Neonatal Mortality Among Full-Term Infants, Differentiated by Sex (in percent)**

Cause of death	Stillborn		Age of infant			
			Six days or under		7-27 days	
	M	F	M	F	M	F
IUA	72.2	71.8	16.5	18.7	—	6.2
IUI	11.3	6.4	19.8	18.7	15.0	6.2
BI	5.1	7.6	33.0	14.6	20.0	12.6
NPP	—	—	4.4	12.6	—	—
HDN	3.1	3.8	2.2	10.4	—	—
DD	6.2	9.0	20.8	22.9	30.0	25.0
Other	2.1	1.3	3.3	2.1	35.0	50.0

Among the premature infants, who made up 36.8%, stillborns represented 34.9%, and newborns, 65.1% (the ratio of males who died to females who died was 78:100 and 148:100, respectively; Table 3). The cause of death were the following: most frequent among stillborns, IUA; among the newborns, NPP and IUI. In the late neonatal period, perinatal pathology was the cause of death in 47%.

## PUBLIC HEALTH

JPRS-ULS-90-010  
2 July 1990

**Table 3. Structure of Perinatal and Late Neonatal Mortality Among Premature Infants, Differentiated by Sex (in percent)**

Cause of death	Stillborn		Age of infant			
			Six days or under		7-27 days	
	M	F	M	F	M	F
IUA	82.2	75.0	11.3	14.6	6.3	11.1
IUI	—	8.4	23.9	16.7	18.7	22.2
BI	—	2.8	9.9	16.7	12.5	—
NPP	—	—	40.8	33.3	6.3	—
HDN	10.7	2.8	2.8	6.2	—	5.5
DD	7.1	5.5	9.9	6.2	—	11.1
Other	—	5.5	1.4	6.3	56.2	50.1

In studying the times of death among the stillborns, it turned out that 46% of the deaths were antenatal (male/female ratio, 93:100) and 54% were intranatal (126:100). According to our data, among those who died antenatally, 36.4% were premature infants, and 63.6% were mature. Among those who died intranatally, the figures were 18.6% and 81.4%, respectively.

Of all who died, 34.5% died during the first 24 hours of the early neonatal period (m/f ratio 207:100). There were no males in the HDN group.

In a retrospective analysis, it was determined that cases of nonspecific fetopathy (the infants died in the very first hours after birth) were among the NPP and IUA groups.

During the next two days (i.e., under three days of age), 45% of the infants died (m/f ratio, 170:100). In all the groups (except HDN and Other), males predominated.

By the end of the perinatal period (i.e., between 4 and 7 days of age), 25.0% of the newborns died (m/f ratio, 121:100). In the IUI, NPP, HDN, and Other groups, females predominated.

During a period of episodic study of the spinal cord, the incidence of birth injuries was 9.5% (intracranial 90%, spinal 5%, and other 5%). In a systematic study of the spinal cord, the incidence of injuries grew to 16.6%, of which intracranial injuries represented 38%, spinal, 38%, craniospinal, 17%, and other, 7%.

The results of the analysis that was conducted showed that systematic study of the spinal cord and the canal of the vertebral arteries not only increased the number of birth injuries found because of the spinal injuries, but also changed substantially the structure of the injuries and made it possible in some cases to identify the main cause of pneumopathy development. A similar approach

to the problem of birth injuries and pneumopathy produced a positive assessment of the obstetricians and neonatologists of the maternity hospitals and departments served.

An analysis of the times of death in the late neonatal period, depending on the time of arrival at the hospital, shows that 14.3% died during the first 24 hours at the hospital after being released from the maternity hospital; 5.7% died during the first three days. Those children, regardless of the type of pathology during hospitalization, were released from the newborn departments as healthy, but then came back. In that group, those who died from diseases of the perinatal period were as follows: 40% who died in the first 24 hours (all from developmental defects) and 75% during the first three days (with IUI, BI, and DD accounting for 25% each).

Among those who died at the age of 10 days or older were children who either had been under observation in a newborn department from birth until death or had been released from the maternity hospital, but came back. Some 40% of the children died during the first 10 days of hospitalization or the first 10 days after birth, and 60.7% of them died of perinatal pathology. Of the total number of postnatal pathologies (39.3%), infections of the gastrointestinal tract or the respiratory system accounted for 25%. Some 40% of that age group died after 10 days of hospitalization; of them 46.4% died of diseases of the perinatal period. Of 53.6% of the postnatal pathologies, 28.5% were due to infections of the gastrointestinal tract or the respiratory system. In other words, a growth in that group of diseases is observed.

Analysis of the causes of perinatal death—disregarding the influence of pathology from the mother—showed that IUA, IUI, HDN, and DD occupy a central role among stillborns, and that NPP, IUI, BI, and DD play such a role among those who died in the early neonatal period. In the late neonatal period, diseases of the perinatal period account for 52.9% of all causes. The percentage of premature infants grew from 26.8% among the stillborns to 54.7% by the end of the perinatal period, remaining at a level of 48.5% in the late neonatal period. The percentage of males is large in the intra- and postnatal periods—55.8% and 59.7%, respectively.

As a result of a comparison in terms of nosological forms between the groups of full-term and premature infants who died (Table 4), it was established that the percentage of IUA-caused deaths is considerably higher among full-term infants; the percentage of IUI is roughly equal in full-term and premature infants; BI is observed almost twice as often among full-term infants; NPP is observed more than seven times as often among premature infants; and DD predominates among full-term infants. The percentage of “other” diseases is virtually identical in both groups.

**Table 4. Structure of Perinatal Death of Infants, Differentiated by Gestational Age (in percent)**

Cause of death	Premature infants	Full-term infants
IUA	35.5	47.8
IUI	15.3	13.7
BI	8.7	15.3
NPP	24.6	3.2
HDN	4.9	4.1
DD	7.7	13.7
Other	3.2	2.2

The number of infants who died antenatally and intranatally, according to our data, exceed that found in a large city. It also turned out to be larger than the number of those who died during in the first three days.<sup>4</sup>

In conclusion, it should be noted that the profile of perinatal nosology in terms of causes of death depends not just on the system of its calculation, but also on the completeness of the pathologic anatomy study. A painstaking, comprehensive pathologic anatomy study of each section case, with the use of additional methods, is fundamental to the identification of the true nosological structure of perinatal death. For that, the autopsy units that serve the maternity hospitals and the pregnancy pathology departments should have more fluorometry-diagnostics laboratories, must the appropriate staff, and must have standard sets of fluorescing antibodies. Further improvement is needed of the antemortem and postmortem diagnostics of diseases of the fetus and the newborn. In that regard, complete pathologic anatomy study of fetuses weighing between 500 and 900 g would be a big help—and not merely anthropometric analysis, as is called for by order of the USSR Ministry of Health (1985)—when the infants are released from the maternity hospitals and from departments of pregnancy pathology and gynecology.

#### Bibliography

1. Kalashnikova Ye. P. TRUDY LENINGRAD. NAUCH. O-OVA PATOLOGOANATOMOV, 1981, No 22, pp 25-29.
2. Kartushina L. M., Kachenyuk Yu. A. AKUSH. I GIN., 1984, No 10, pp 73-74.
3. Kachala V. Yu. ZDRAVOOKHR. ROS. FEDER-ATSII, 1982, No 6, pp 16-19.
4. Ryabtseva I. T., Polyakov I. V., Sokolova N. S. Ibid, 1985, No 8, pp 24-27.
5. Shmurun R. I. ARKH. PAT., 1966, No 1, pp 71-74.
6. Shmurun R. I. Ibid, 1982, No 1, pp 85-88.

#### Joint Venture to Produce Disposable Syringes in Tashkent

18402094 Moscow MEDITSINSKAYA GAZETA  
in Russian 7 Jun 89 p 4

[Article by G. Kryuk, lead engineer of the joint venture Sovplastital, and MEDITSINSKAYA GAZETA correspondent V. Zhuravlev: "The Disposable Syringe—300 Million per Year"; first paragraph is source introduction. Also see JPRS-ULS-90-008, p 64 for earlier report]

[Text] Starting in the first quarter of the coming year, the Soviet-Italian joint venture for manufacture of plastic consumer goods and souvenirs, Sovplastital, will begin producing 300 million disposable syringes per year in Tashkent.

The syringe—that most rudimentary of medical implements—has recently become a kind of index of the level of development of medicine in various countries of the world. Unfortunately, we have long been in the wake of technical progress in this area. The efforts to develop and introduce into medical practice Soviet-made disposable syringes have thus far been unsuccessful. Licensing deals, barely set in motion, would be slowed and reduced to naught by "studies" and "arguments" in the impenetrable offices of the agencies and ministries. The purchase of large lots of syringes abroad, as pointed out at the April (1989) plenum of the CPSU Central Committee, was simply bungled.

The current need of the country is two billion disposable syringes. Yet the Ministry of Medical and Biological Industry plans to produce 150 million of them this year. A drop in the bucket. That is why the step taken by the joint venture in Tashkent is so crucial to the health care sector of the country. Utilizing its status and rather strong ties with Western suppliers, Sovplastital concluded a contract with one of the Italian companies to deliver and install in Tashkent a modern, computer-controlled, automated production line for such syringes, with an output of 300 million pieces per year. For comparison, let us note that one of the largest companies of Europe, MAP (Italy), produces 500 million plastic syringes per year. Thus, in terms of volume of production, the enterprise in the capital of Uzbekistan will take its place alongside the leading Western producers.

Tashkent is taking a certain commercial risk. The deadlines for startup of the unique enterprise, consisting of a multitude of subdivisions and services, are extremely tight. Each of the machines making up the enormous line is unique in its own right and requires extremely intricate servicing. Even the purity of the air in the assembly and warehousing areas and the laboratory buildings must comply with all the WHO standards.

The Council of Ministers of the republic, in view of the urgency of the planned production, has adopted a special regulation to hasten the organization of production.

An additional six million nonexchangeable rubles will be transferred to the account of Sovplastital at the Foreign Economic Bank.

UDC 613.495:658

**Experience in the Use of the Economic Mechanism in the Activity of Medical Cosmetology Facilities**

18402145B Moscow SOVETSKOYE  
*ZDRAVOOKHRANENIYE* in Russian No 4, 89  
pp 26-29

[Article by V. A. Minyayev, A. Ya. Uritskiy and I. V. Polyakov, First Leningrad Medical Institute imeni Acad. I. P. Pavlov; Novgorod Medical Cosmetology Facility]

[Abstract] The Novgorod cosmetology polyclinic has revamped its operations and is now offering its services on a fee-for-service basis. A price list has been compiled for the various procedures that reflects the demand for a particular type of service, with the fate of the facility resting on turning a profit. A part of the profit is reinvested in the facility in the form of various upgrades, as well as in bonuses for the personnel, improvements in staff living quarters, exercise and massage facilities, and so forth. After one year of operation on a profit-making basis and cost accountability the volume of rendered medical services has increased by 30%, a fact that translated into an additional income of 48,000 rubles. In addition, productivity increased by 45% in 1987 in comparison with 1986, and the average salary increase for all levels of staff grew by 50-60%. The success of the program has engendered plans to offer cosmetology services to tourists in conjunction with arrangements made with Inturist.

UDC 61+57]:001.8:002.6

**Logic-Semantic Modeling of Hardware and Software Configurations for Biomedical Measurements**

18402117 Moscow VESTNIK AKADEMII  
*MEDITSINSKIH NAUK SSSR* in Russian No 4, 89  
(manuscript received 16 Nov 88) pp 77-83

[Article by S. F. Ostap'yuk, Yu. V. Grum-Grzhimaylo and B. V. Ionov, Central Order of Lenin Institute of Postgraduate Medicine, USSR Ministry of Health, Moscow]

[Abstract] The creation of automatic biomedical measurement systems requires logic-semantic modeling of hardware and software configurations suitable for clinical and research applications. The development of such modeling systems has become one of the most important research areas of medical informatics. The logic-semantic approach was designed to allow maximum selectivity of sensors to permit a wide variety of diagnostic applications through the formulation of a semantic network reflecting the various technical components. Automation is attainable in two stages. In the first stage individual procedures used for the extraction and collation of information are automated through reliance on standard packets of application programs. The second stage of automation involves development of special expert systems. References 6 (Russian).

UDC 313.1:616-006(476)

**Materials From Press Releases of the BSSR State Commission of Statistics**

18402066 Minsk ZDRAVOOKHRANENIYE  
*BELORUSSII* in Russian No 2, Feb 89 p 78

[Article statistical materials of BSSR State Commission of Statistics]

[Text] At the end of 1987, more than 100,000 individuals with malignant neoplasms were registered at treatment institutions of the republic. By comparison with 1985, the level of morbidity due to malignant neoplasms grew 10% and represented 186 persons per 100,000 population. Over the two years that passed, the greatest growth in morbidity due to this serious illness was noted in the Gomel, Grodno, and Mogilev oblasts (13-17%).

Malignant neoplasms rank second among the population in the republic among causes of death. In 1987, some 15,600 individuals died from malignant neoplasms, that is, 154 per 100,000 inhabitants. In 1985, those figures were 14,500 and 145, respectively. The biggest killers among malignant neoplasm are cancer of the stomach, which accounted for 3,400 death (22%), and cancer of the trachea, bronchi, and lungs, which accounted for 3,100 deaths (20%). By comparison with 1985, death from cancer of the lip, mouth cavity, and throat increased by 35%; from cancer of the esophagus, by 14%; from cancer of the trachea, bronchi, and lungs, by 13%; and from cancer of the skin, by 12%

**Table 1. Morbidity Due to Malignant Neoplasms Among the Population of BSSR (number of individuals with first-time diagnosis)**

	1985		1987	
	Absolute number	Per 100,00 population	Absolute number	Per 100,00 population
Belorussian SSR	21,368	169.0	24,158	186.1
Brest Oblast	2,815	157.2	3,055	165.9
Vitebsk Oblast	3,375	171.5	3,607	181.5
Gomel Oblast	3,328	153.7	3,940	179.9
Grodno Oblast	2,438	157.2	2,785	177.8
City of Minsk	3,001	230.5	3,536	247.1
Minsk Oblast	3,362	160.3	3,720	175.3
Mogilev Oblast	3,049	177.2	3,515	200.8

**Table 2. Number of Oncologists in BSSR and by Oblast**

	1985		1987	
	Absolute number	Per 100,00 population	Absolute number	Per 100,00 population
Belorussian SSR	442	0.44	440	0.44
Brest Oblast	47	0.33	37	0.26
Vitebsk Oblast	46	0.34	47	0.33
Gomel Oblast	40	0.24	46	0.28
Grodno Oblast	43	0.38	45	0.39
City of Minsk	216	1.41	223	1.39
Minsk Oblast	24	0.15	17	0.11
Mogilev Oblast	26	0.20	25	0.19

**Table 3. Beds for Patients With Oncological Diseases and Their Distribution in the BSSR**

	1985		1987	
	Absolute number	Per 100,00 population	Absolute number	Per 100,00 population
Belorussian SSR	2,855	2.86	2,859	2.83
Brest Oblast	325	2.31	415	2.90
Vitebsk Oblast	380	2.72	390	2.77
Gomel Oblast	310	1.85	325	1.96
Grodno Oblast	275	2.40	299	2.58
City of Minsk	1,215	7.96	1,060	6.61
Minsk Oblast	100	0.65	100	0.64
Mogilev Oblast	250	1.95	270	2.09

UDC 614.2:312.6

#### Improving Annual Statistical Accounting

18402019B Moscow SOVETSKOYE  
ZDRAVOOKHRANENIYE in Russian No 2, 89  
pp 31-36

[Article by Candidate of Medical Sciences F. G. Grigoryev, Kanash Central Rayon Hospital, Chuvash ASSR]

[Abstract] Comprehensive improvement of annual statistical accounting is central to improving management and to achieving an expert combination of practice and

planning. The current paperwork used in performing the annual accounting in the Soviet Union (Form No. 1), although long and unwieldy (it uses about 2,000 quantitative and qualitative indices), has no sections that deal with changes in demographic processes, structure of causes of death, totals of work lost because of temporary disability or primary disability, duration of active work life, or the health screening process. The author compiled and presented a new form as a suggested replacement for Form No. 1. His form condenses all the activity of health-care organs and institutions over a year's time to fit one and a half printed pages; the form can be filled out in a day by two people—the deputy chief physician

**PUBLIC HEALTH**

for the network and a medical statistician. The structure of the new form contains information on changes that have been recorded over a three-year period for indices such as average population figures for a region, medical

staffing levels, number of hospital beds, basic demographic indices, structure of causes of death, figures for disability, and work life after a given age. Figures 1, references 6 (Russian).

UDC 577.39:58.02

**Enhancement of Radioresistance of Genetic Structures of Plant Cells With Preliminary Low-Dose Gamma Irradiation of Seeds**

18402140 Sverdlovsk EKOLOGIYA in Russian No 1, 89  
(manuscript received 19 Jul 88) pp 3-8

[Article by N. V. Kulikov and L. K. Alshits, Institute of Plant and Animal Ecology, Ural Division, USSR Academy of Sciences]

[Abstract] Kapital variety peas (*Pisum sativum*) were employed as the test species in studies on the effects of low-dose irradiation of seeds on radioresistance of the plant genome. The seeds were gamma-irradiated with low doses (0.5-10.0 Gy, 0.22 Gy/min), maintained in water for 24 h at 22-24°C to induce swelling, and gamma irradiated with a mutagenic dose of 25 Gy. The seeds were allowed to germinate and the percentage of meristem cells with chromosomal aberrations determined. Control unirradiated seeds and seeds preirradiated with 0.5 or 1.0 Gy had background levels of 3.-3.6% cells with chromosomal aberrations. Control seeds subjected only to the 25 Gy dose yielded shoots in which 58.3% of the meristem cells contained chromosomal anomalies. However, preirradiation reduced this figure to 38.0%. The protective effects of low-dose preirradiation were attributed to activation of repair enzymes, an impression

supported by the fact that treatment of the seeds with acriflavine prior to the irradiation abolished the radioprotective effects of low-dose preirradiation. Figures 3; references 14: 13 Russian, 1 Western.

UDC 633.511:577.158/631.824+531.1:539.16

**Radioprotective Effects of Magnesium Chloride on Redox Enzyme Activity and Chlorophyll Content in Cotton**

18402186A Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 2, Mar 89 (manuscript received 14 Jan 88) pp 3-5

[Article by A. Nigmanov, V. M. Pak and O. N. Kuznetsova, All-Union Order of Lenin and Order of People's Friendship Scientific Research Institute of Cotton Growing]

[Abstract] Gamma-ray irradiation of cotton seed with a 20 kR dose was shown to result in depressed activities of catalase and elevated activities of peroxidase in the resultant plants. In addition, irradiation of the seeds also led to diminished chlorophyll concentration in the leaves. However, pretreatment of the seeds with 0.1, 0.5, 1, 2, or 3% magnesium chloride for 24 h before irradiation reversed the effects of irradiation in a dose-related fashion, confirming the radioprotective role of this salt. References 6: 5 Russian, 1 Western.

**Prevention of Respiratory Diseases at Heifer Breeding Farms**

*18402169B Moscow VETERINARIYA in Russian No 5, May 89 pp 18-19*

[Article by V. V. Sinitskiy, chief rayon veterinarian, V. S. Garin, director, specialized farm "Krasnyy Kolos," Zarayskiy Rayon, Moscow Oblast, and A. P. Bereznev, All-Union Scientific Research Institute of Veterinary Sanitation]

[Abstract] The success of a dairy cattle breeding farm depends to a large extent on controlling disease, with prevention constituting the most economical and effective approach. Experience has demonstrated that disinfection of barns and other facilities has had a significant impact on reducing the morbidity and mortality of calves due to respiratory infections. In addition, disinfection with aerosols of formaldehyde, peracetic acid, dimethoxymethane, alkanuk [sic], or formaz [sic] has been shown to be especially effective, easy to apply, and economical. In situations with extensive outbreaks of respiratory infections among calves, aerosol treatment with lactic acid, norsulfazole, or streptomycin in closed chambers was demonstrated to reduce mortality and promote greater weight gain.

UDC 619:616.981.51:616-084

**Anthrax Prevention**

*18402169E Moscow VETERINARIYA in Russian No 5, May 89 pp 41-42*

[Article by N. G. Ipatenko, N. T. Tatarintsev and A. A. Manichev, All-Union State Quality Control Institute of Veterinary Preparations, and V. N. Gushchin, Main Veterinary Administration, USSR Gosagroprom]

[Abstract] Vaccination remains the most effective method of controlling anthrax and has been widely practiced in Siberia. Nevertheless, anthrax continues to be a serious veterinary problem and a health threat to humans. Statistics for the past 30-50 years show that in a majority of the regions outbreaks of anthrax occur every 2-10 years. In areas with the highest morbidity patterns vaccination is conducted twice a year, in spring and fall, since it has been demonstrated that immunity wanes after about six months. Additional measures include soil treatment for the inactivation of anthrax bacilli with methyl bromide alone or in combination with ethylene oxide. Finally, for a fully comprehensive approach public education has to be combined with strict adherence to acceptable veterinary sanitary practice in the disposal of domestic animals dying of anthrax.

UDC 619:616.981.49:615.37:636.22/28

**Effect of Immunostimulators on Antisalmonella Immunity in Calves**

*18402169D Moscow VETERINARIYA in Russian No 5, May 89 pp 35-37*

[Article by A. I. Tesh and V. M. Chekishev, Institute of Experimental Veterinary Medicine of Siberia and the Far East]

[Abstract] Trials were conducted on the effect of immunostimulators on antibody response to formalized salmonella vaccine in newborn calves born to unimmunized cows. The immunostimulators (30% sodium thiosulfate (ST), pyrogenal, PS-1/1, PS-1/3, sodium nucleinate) were mixed with the vaccine and used for immunization of 10-day-old calves and reimmunization seven days later. Monitoring the serum antibody response against salmonella over a 45-day period showed that that the highest response in agglutination tests was obtained with vaccines mixed with ST and PS-1/1. In addition, calves vaccinated with these combinations also presented with a weight gain that was approximately 30% greater than of the animals immunized with the vaccine alone.

**Perestroyka and Cost Accounting in Veterinary Sciences**

*18402169A Moscow VETERINARIYA in Russian No 5, May 89 pp 3-7*

[Article by V. V. Filippov, deputy general director, Specialized Scientific Complex for Veterinary Sciences, All-Union Academy of Agricultural Sciences imeni Lenin]

[Abstract] Perestroyka has become synonymous with cost accounting in engendering a sense of economic efficiency and accountability, a development that has also had a serious impact on the veterinary sciences. In conjunction with the decisions of the CPSU Central Committee and the USSR Council of Ministers, the All-Union of Academy of Agricultural Sciences has responded by the creation of a complex of nine leading research institutions to plan and coordinate veterinary research in response to the needs of the Soviet agricultural sector. As such, the new approach emphasizes cost-effectiveness and accountability and is designed to eliminate duplication and wastefulness of resources. Research will be based on demonstrated need and marketability, as determined by solid market research. In addition, the program of economic incentives shall undergo considerable expansion at the institutional and individual levels to stimulate productivity and initiative.

UDC 619:614.9.614.48:631.227

**Disinfection of Hen-Houses with Bactericidal Foams**

*18402169C Moscow VETERINARIYA in Russian No 5, May 89 pp 29-30*

[Article by D. I. Udvavliyev, All-Union Scientific Research Institute of Veterinary Sanitation]

[Abstract] Extensive trials conducted with various bactericidal forms for the disinfection of hen-houses have demonstrated their efficacy in controlling morbidity and mortality among poultry. One key advantage of this approach is the ease of application and economy in terms of the concentration of drugs that have to be used. Laboratory studies with glutaraldehyde, formalin, chloramine B, or hydrogen peroxide foams have demonstrated their efficacy against bacterial and fungal pathogens that commonly afflict poultry. In general, about 200-500 ml/m<sup>2</sup> of the foam are required for disinfection of hen-houses and other facilities with preparations utilizing anionic surfactants.

UDC 619:616.981.136

**Epizootiologic Monitoring of Listeriosis in Animals**

*18400169F Moscow VETERINARIYA in Russian No 5, May 89 pp 43-46*

[Article by I. A. Bakulov, V. M. Kotlyarov and V. Ye. Belousov, All-Union Scientific Research Institute of Veterinary Virology and Microbiology]

[Abstract] Epizootiologic assessment of listeriosis among domestic animals in the USSR for the period 1956-1987 has shown that vaccination on a large scale is relatively

ineffective as a means of prevention. Listeriosis is widespread in the USSR, and annual outbreaks are reported in every republic with the exception of Turkmen SSR. Sheep account for 75% of the total morbidity and 83% of the mortality. In the entire 1956-1987 period, mortality for infected cattle stood at 37.52%, sheep 45.17%, and pigs 28.56%. However, the mortality figures for the 1977-1987 decade were lower than for the previous decade. On average, there were 36 cases reported per every high-risk region, with a range of 2-166 cases. The prevalent view is that vaccines should be reserved for clinical cases and attempts to limit spread in a given vicinity, rather than be employed in mass vaccination schemes. Figures 3.

UDC 619:616-006.446:351.779.003.3

**Automated Epizootiologic Monitoring of Bovine Leukemia**

*18402169G Moscow VETERINARIYA in Russian No 5 May 89 pp 46-49*

[Article by G. A. Michule, All-Union Scientific Research and Design-Engineering Institute of Cybernetics, All-Union Academy of Agricultural Sciences imeni Lenin, V. A. Dzenis, LaSSR Veterinary Laboratory, LaSSR Gosagroprom, V. A. Sedov, Main Veterinary Administration, USSR Gosagroprom, and M. G. Tarshis, All-Union Scientific Research and Engineering Institute of the Biological Industry]

[Abstract] Cursory description is provided of the creation of an automatic SELEKS system for monitoring the incidence of bovine leukemia in Latvia. The system incorporates data banks containing serologic, hematologic, and pathoanatomic information, for correlation with data on the genetic structure of Latvian herds. The information thus available facilitates analysis of the dynamics of the disease in Latvia in relation to genetic and exogenous factors, and the cost effectiveness of control measures. Figures 1.

UDC 576.8.096

**Specific Immunoglobulins From the Yolks of Eggs of Japanese Quail Immunized With Influenza and HIV-1 Viruses**

18400644 Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 37 No 1, Jul 89 (manuscript received 5 Dec 88) pp 229-233

[Article by A. A. Kovgan, Ye. I. Isayeva, Z. I. Rovnova and A. A. Shilov, Institute of Virology, USSR Academy of Sciences, Moscow]

[Abstract] One of the more serious problems in production of diagnostic, prophylactic or therapeutic anti-viral preparations is the development of economically feasible systems for production of satisfactory viral antigens. Japanese quail (*Coturnix turnix japonica*) embryos are used in production of vaccines against pathogens in some pediatric diseases because they are resistant to infectious diseases. There are no literature data on the dynamics of the formation of immune

response in quail or on the use of specific immunoglobulins isolated from their egg yolks in immunochemical processes. In the interests of studying the possibility of using such immunoglobulins to identify recombinant HIV-1 polypeptides, the researchers here describe the engineering of recombinant plasmids that code for the synthesis of polypeptides in the env-lor region of HIV-1 virus and report results of the analysis of the dynamics of the formation of immunity and the synthesis of immunoglobulin in Japanese quail immunized beforehand with influenza virus (A/Philippines 2/82-H3N2), HIV-1, and purified by a recombinant antigen of HIV-1 surface protein. It was shown that polyclonal antibodies to natural antigen of HIV-1 obtained from Japanese quail egg yolks contain specific immunoglobulins for HIV-1 polypeptides of the env-lor region synthesized in *E. coli*, with rather high specificity. The egg yolks of immune quail can serve as excellent sources of polyclonal antibodies to a wide spectrum of antigens. Figures 3; references 15: 5 Russian, 10 Western.

This is a U.S. Government publication. Its contents in no way represent the policies, views, or attitudes of the U.S. Government. Users of this publication may cite FBIS or JPRS provided they do so in a manner clearly identifying them as the secondary source.

Foreign Broadcast Information Service (FBIS) and Joint Publications Research Service (JPRS) publications contain political, military, economic, environmental, and sociological news, commentary, and other information, as well as scientific and technical data and reports. All information has been obtained from foreign radio and television broadcasts, news agency transmissions, newspapers, books, and periodicals. Items generally are processed from the first or best available sources. It should not be inferred that they have been disseminated only in the medium, in the language, or to the area indicated. Items from foreign language sources are translated; those from English-language sources are transcribed. Except for excluding certain diacritics, FBIS renders personal names and place-names in accordance with the romanization systems approved for U.S. Government publications by the U.S. Board of Geographic Names.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by FBIS/JPRS. Processing indicators such as [Text] or [Excerpts] in the first line of each item indicate how the information was processed from the original. Unfamiliar names rendered phonetically are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear from the original source but have been supplied as appropriate to the context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by the source. Passages in boldface or italics are as published.

#### SUBSCRIPTION/PROCUREMENT INFORMATION

The FBIS DAILY REPORT contains current news and information and is published Monday through Friday in eight volumes: China, East Europe, Soviet Union, East Asia, Near East & South Asia, Sub-Saharan Africa, Latin America, and West Europe. Supplements to the DAILY REPORTs may also be available periodically and will be distributed to regular DAILY REPORT subscribers. JPRS publications, which include approximately 50 regional, worldwide, and topical reports, generally contain less time-sensitive information and are published periodically.

Current DAILY REPORTs and JPRS publications are listed in *Government Reports Announcements* issued semimonthly by the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22161 and the *Monthly Catalog of U.S. Government Publications* issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

The public may subscribe to either hardcover or microfiche versions of the DAILY REPORTs and JPRS publications through NTIS at the above address or by calling (703) 487-4630. Subscription rates will be

provided by NTIS upon request. Subscriptions are available outside the United States from NTIS or appointed foreign dealers. New subscribers should expect a 30-day delay in receipt of the first issue.

U.S. Government offices may obtain subscriptions to the DAILY REPORTs or JPRS publications (hardcover or microfiche) at no charge through their sponsoring organizations. For additional information or assistance, call FBIS, (202) 338-6735, or write to P.O. Box 2604, Washington, D.C. 20013. Department of Defense consumers are required to submit requests through appropriate command validation channels to DIA, RTS-2C, Washington, D.C. 20301. (Telephone: (202) 373-3771, Autovon: 243-3771.)

Back issues or single copies of the DAILY REPORTs and JPRS publications are not available. Both the DAILY REPORTs and the JPRS publications are on file for public reference at the Library of Congress and at many Federal Depository Libraries. Reference copies may also be seen at many public and university libraries throughout the United States.